Convention Report Issue

ELECTRICAL WEST

June 1958
50 Cents

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

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Last Chance!
Win $500 in Electrical West's Load Forecasting Contest
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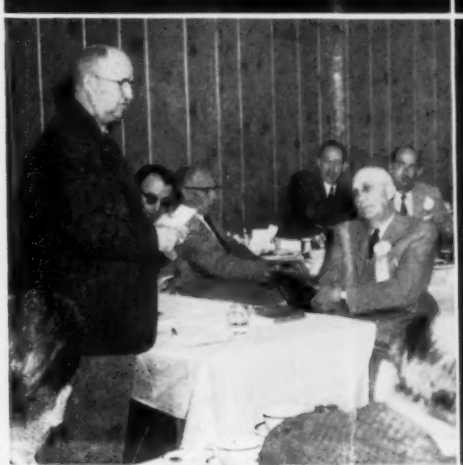
Conventions...
Sharing Know-How

Conventions...
Are Fun Too!



Conventions...
Building Teamwork

4 Questions to ask before you buy that home

(or, why you should look for the Live Better Electrically "Medallion" on the home you buy)

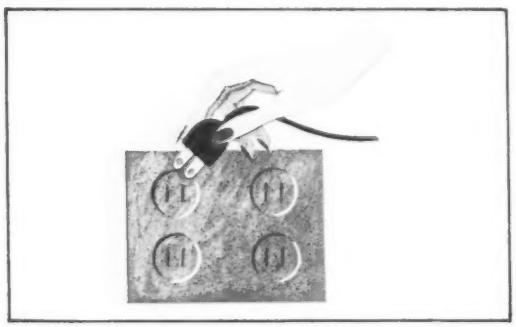
1. Are the electric appliances you want already installed?

Two out of three homes being built today do not provide the modern appliances people want most. In most cases no wiring provision is even made for their eventual installation. These "new homes" are electrically obsolete the day you buy them.

A home which is awarded the Medallion symbol contains an ultra-modern electric range *built-in,* plus at least three other major appliances that go with the plan of the house, and are located to save time and energy. And wiring for future needs is in and paid for.

3. Has the home been planned to give you "light for living"?

Provisions have been made in *every* "Medallion" home for proper lighting which will beautify and decorate as well as illuminate the home. Special fixtures light such important, but often neglected, areas as the kitchen sink, bathroom shower and mirror, and outside each entry to the home.



2. Is the home properly wired for "Full Housepower"?

Only one out of three new homes is equipped for modern electric living... but *every* "Medallion" home is. It has plenty of outlets and switches in *convenient* locations. It has enough separate circuits for proper and efficient power distribution—and provision for the extra circuits for those appliances you'll want later on.

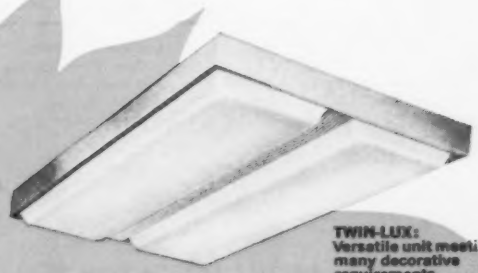
4. Has the home been awarded the Live Better Electrically "Medallion"?

If it has, you know electric utility experts have worked with builders while their homes were still in the planning stage. They made sure that you'll live better electrically *the day you move in* by providing for electrical necessities while the home is being built. The saving to you—both present and future—is enormous.

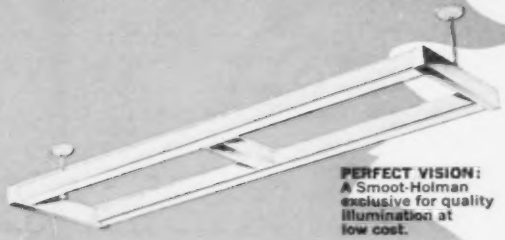
SOUTHERN CALIFORNIA Edison COMPANY *helps you* LIVE BETTER—ELECTRICALLY

SMOOT-HOLMAN

your best source for "tomorrow's lighting today"



TWIN-LUX: Versatile unit meeting many decorative requirements.

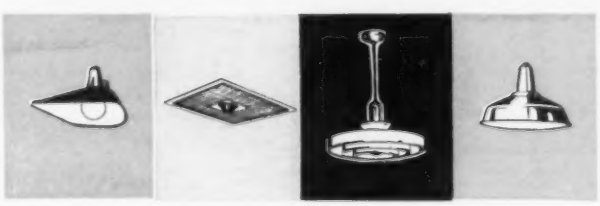


PERFECT VISION: A Smoot-Holman exclusive for quality illumination at low cost.

SHALLOLITE: Outstanding styling coupled with top lighting performance.

INDUSTRIAL FLUORESCENT: Quality construction designed to RLM standards.

A complete selection of commercial fluorescent, industrial fluorescent, commercial incandescent, industrial incandescent and outdoor flood lighting equipment.



PROPER LAYOUT MADE EASIER! Send for your FREE Smoot-Holman "Lighting Guide" ...and auto-calculator to compute the required lamps and fixtures for most commercial and industrial interiors.

Certified Lighting

SMOOT-HOLMAN COMPANY · *Inglewood, California*

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U.S. Established 1887

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Then he says: "Line Material is announcing **SRT** on June 23rd!"

Big deal! So I says: "George, there is a time and place for everything"...

Panelboard planning

Altenhof & Bown

helps Power-Up State Office Building

The new Commonwealth of Pennsylvania Office Building in Pittsburgh exemplifies the type of planning that powers-up today for future needs.

More than 40 Westinghouse Panelboards (Type NLAB & Type CDP) provide for lighting and distribution system protection and service continuity completely adequate for today's demands, and readily capable of expansion or modification to meet tomorrow's ever-increasing electrical needs.

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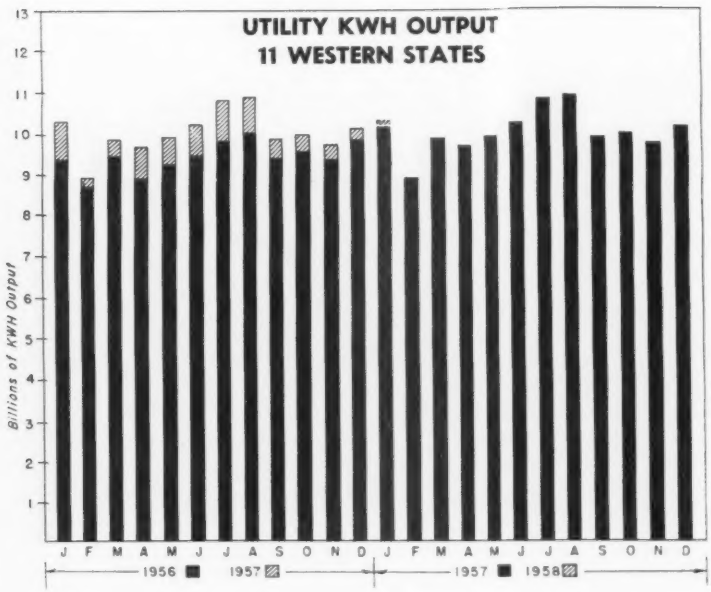
J-93542

Westinghouse CDP Panelboards installed in the new State Office Building to provide protection and control of power circuits. Shown on wall at left is one of the Type NLAB Panelboards which protect building lighting circuits.

YOU CAN BE SURE...IF IT'S Westinghouse

----How're We Doing?



Output Comparisons

Year-to-year Kwh Output Changes in Western Regions and U. S.
Per Cent Changes Over Same Week One Year Ago

Week Ending	Rocky Mountain	Pacific Southwest	Pacific Northwest	U. S. Total
April 5	−0.8	−2.1	+0.1	−3.1
April 12	−0.7	−7.5	−6.4	−3.3
April 19	−0.8	+3.9	−8.1	−3.3
April 26	+2.1	+3.3	−5.9	−0.9

Highlights of First Quarter Earnings

Consolidated net sales of Federal Pacific Electric Co. for the nine months ending March 31 were $40,743,118; net profit after taxes, $2,001,550. Net earnings after payment of preferred stock dividend were $1.85 per share as compared with $1.78 for the same period last year.

Whirlpool's interim report showed net sales of $88,197,588 for the first quarter as compared with $114,215,133 in 1957. Net earnings were 29¢ per share of common, down 14¢ from last year.

Highest sales for any quarter in its history—$20,200,000—are reported by Emerson Electric Mfg. Co. for the first three months. March sales totaled $7,500,000 for the best single month ever experienced by the company.

Westinghouse Electric sales billed in the first quarter were $449,329,000, 5.5% below last year. Net income was down 9.1% and earnings on common dropped 11% to 73¢ a share. New business booked in the first quarter, however, exceeded sales billed.

First quarter sales of $4,723,451 compared to $4,781,156 in the same period last year were reported by Thomas Industries. First quarter net earnings were $149,268 in 1958, $197,580 in 1957.

Sylvania's net sales were $72,132,543, compared with $87,549,674 a year ago. Net income was $1,167,818 this year; $3,069,944 last year.

Sales and earnings below the record first quarter of 1957 were reported by General Electric. Net sales billed decreased 8% to $964,966,000 as compared with the same period last year but were 2% higher than in the 1956 first quarter. Three-month earnings were down 23% from 1957 to $49,184,000.

Construction Highlights

Pacific Tel & Tel Co. will construct a seven-story headquarters building in San Francisco. Cost: $4,500,000.

High school at Everett, Wash., $2,174,000.

Housing development at Walla Walla, Wash., 150 to 200 dwellings, $1,500,000.

Dairy processing plant in Englewood, Colo., $1,000,000.

Addition to courthouse in San Bernardino, Calif., $1,200,000.

Salt Lake City, Utah, voted bonds for school construction, $4,200,000.

Race track at Gateway Park, Albuquerque, N. M., $1,500,000.

Thirteen-story apartment building at Seattle, Wash., $1,500,000.

Standard Oil of California refinery at Oahu, T. H., with office, warehouse, shop and laboratory facilities, $40,000,000.

City of Seattle, Wash., will rebuild Civic Auditorium as a concert hall, $2,000,000.

Business Administration classroom building at UCLA, Westwood, Calif., $3,500,000.

Residential construction at Kearns, Utah, 78 residences to cost $780,000.

Puget Sound Power & Light Co. switching station and distribution facilities at Bellevue, Wash., $950,000.

Student housing at Central Washington College of Education, Ellensburg, Wash., $1,260,000.

Atomic Energy Commission will construct laboratory and test facilities buildings at Sandia Laboratory Areas 1 and 3, near Manzano Base, N. M., $1,855,000.

Home development program at Seattle, Wash., 100 homes in a new tract, $30,000,000.

Nine-story office building at Denver, Colo., $2,200,000.

Naval jet air station development, Lemoore, Calif., $20,000,000.

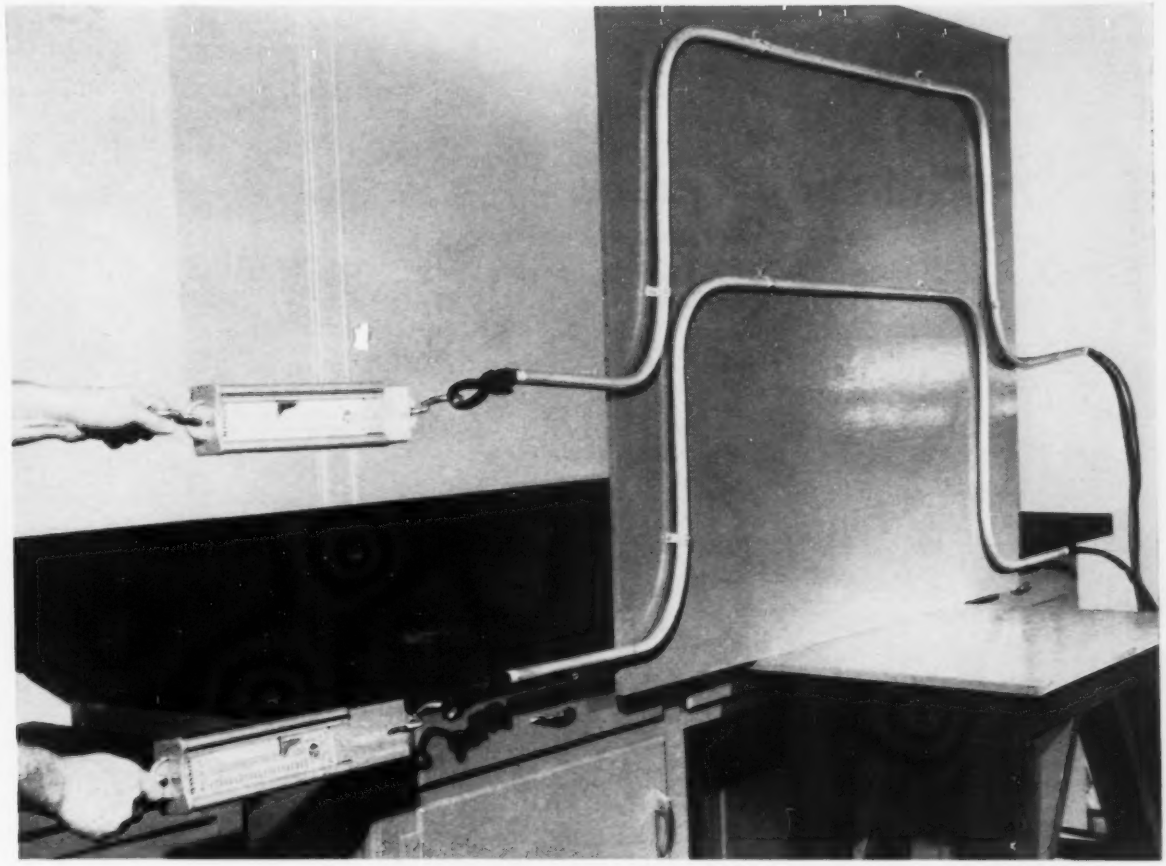
Ideal Cement Co. is planning construction of a plant at Vancouver, Wash., to cost $2,000,000.

Albuquerque, N. M., voted bonds for school additions and new construction, $2,400,000.

New hospital wing and remodeling at Deaconess Hospital, Spokane, Wash., $2,000,000.

Missile base at Spokane, Wash., on which work will begin this summer, $25,000,000.

Corps of Engineers plans for 856 housing units at Fort Lewis, Wash. Cost: $14,000,000.



Cables 50% easier to pull

with Rome's new invisible lubricant!

Two almost identical groups of wire of the *same* size were pulled through *identical* lengths of ½" conduit. *Yet, one group was 50% easier to pull!* Why?

An Actual Test

In the illustration above, you can see that the force needed to pull nine wires (No. 14 AWG) through the bottom section of conduit was approximately 150 pounds. These wires were coated with the conventional paraffin-type lubricant.

Now, note the top half of the test. Same *size* wires. Same *number* of wires. Same ½" *conduit*. But—*these* wires were coated with the new Rome Cable emulsion. Pulling force needed: Less than 75 pounds. Less than *half* the pulling force needed for paraffined wire. You can't see the coating—but, you *can* see the result, and it's permanently bonded to the insulation.

Easier Installations

This new improvement in wire coating can save money for you. With wire and cable pulling easier, you cut installation time and labor costs. There's no problem with the coating flaking off because it is virtually "married" to the insulation. Rome's new emulsion will not "pile up" to plug conduit or "freeze" cables in position.

Furthermore, extensive heating and aging tests have proved that this new emulsion coating will not be absorbed by the insulation, nor will it disappear through volatilization.

Available now

This new extra-low-friction coating is now standard on many of the Rome wires and cables which have Rome Synthinol insulation. A list of wires and cables coated with the new emulsion is shown at the right.

The next time you order building wire, be sure to ask your electrical distributor about Rome Cable's new emulsion-coated, easy-to-pull building wire.

New invisible lubricant now available on these Rome wires and cables:

- Rome Synthinol building wires and cables, Type TW—600 volts.
- Rome Synthinol 901 wires and cables for extra heat and corrosion resistance, Type TW—600 volts.
- Rome FlexAll cable, Types UF and NMC—600 volts.

324

ROME CABLE

CORPORATION

Shown here, inspecting Kansas City Power & Light's new Mobile units are, left to right: I. C. McLain, RT&E representative; R. L. Wright, E. D. Church and F. D. Cochran of Kansas City Power & Light.

KANSAS CITY POWER & LIGHT MAINTAINS SERVICE WITH RT&E EQUIPPED MOBILE UNITS

When necessary repairs must be made to Kansas City Power & Light's line installations, there's no shut-down on power to customers. Mobile substations like these are wheeled into action, taking over the transformer job while replacement or repairs are made on line units. Service is maintained without interruption.

The heart of these mobile substations depends on versatile RT&E DUAL VOLTAGE TRANSFORMERS . . . rated at 100KVA, 2400x7620 — 120/240/277 volts with *Externally Operated Taps* at 8000/7810/7430/7200 volts. These special units also incorporate RT&E's *Externally Operated primary voltage change-over switch.*

This is just another example of RT&E transformers at work, proving again their merits with many of the industry's outstanding and exclusive features.

EXCLUSIVE WOUND CORE
"WEATHER PROTECTED" DESIGN
EXTERNALLY OPERATED CHANGE-OVER SWITCH
EXTERNALLY OPERATED TAPS
FIVE YEAR GUARANTEE

Ask your RT&E representative to demonstrate the five sound reasons why RT&E transformers are better. Or write RT&E Corporation, Waukesha, Wisconsin.

RT&E CORPORATION WAUKESHA, WISCONSIN

HELPING PROVIDE POWER FOR AMERICA

SQUEEZED like an accordion even to the point of edge rupture . . . yet, there is no opening of the welded seam.

FLARED while cold during a cone test. Note the weld. There's not a single indication of a break.

FLATTENED like a pancake—actually creased along the weld. But, look at the weld—still unbroken, and as good as ever.

EXPANDED 25% and flared. If weld flaws existed, this test would find them. But look at it—still strong as ever.

Four-way "torture" tests fail to break the weld on Rome's improved EMT

The purpose of these tests was to prove the strength of a Rome weld. But you can see by the unretouched photographs above that the weld on Rome's EMT just won't break.

In these punishing factory tests, Rome's EMT was squeezed, flared, flattened, and expanded. In each case, the weld was proved to be as strong as the metal itself.

And Rome's EMT offers you much more in addition to high weld strength. You also get these *other* important benefits:

Easy bending. Its strength interferes in no way with Rome EMT's uniform ductility. You can now make even intricate bends easily.

Outstanding fishability. The new slick mirror-smooth inside finish makes Rome's EMT easier and quicker to fish than *any other EMT* you can buy. This means you can wire up your installations much faster.

Corrosion resistance. A uniformly electrogalvanized exterior finish protects your installation against corrosion. Long dependable service life is assured.

This exceptionally durable and sturdy tubing exceeds all standards for thinwall raceways and has full Underwriters' approval.

A free sample of Rome's EMT is yours upon request. Test it and prove to yourself that Rome is your best choice for your next EMT job. Contact your nearest Rome Cable representative—or write to Department 900-B, Rome Cable Corporation, Rome, New York.

ROME CABLE

CORPORATION

EW news roundup

FOREIGN COMPETITION—Two large electrical manufacturers trained their big guns against the purchase of heavy electrical equipment from foreign sources. General Electric Co. pledged its full support to a new federal task force that has been established by the Office of Defense to study the impact of imports of certain heavy electrical equipment on national security.

G-E's former board chairman, Philip D. Reed, recently testified before the House Ways and Means Committee in favor of the extension of the Reciprocal Trade Agreements Act. But he expressed concern over the long-range national defense aspects of foreign procurement of heavy electrical equipment such as power transformers, hydraulic turbines and circuit breakers.

General Electric's position, as stated in a petition to determine the essentiality of heavy electrical power-producing equipment under the Trade Agreements Act of 1955, holds that such equipment is being imported in such quantities as to threaten national security. Primarily importations destroy domestic industry capable of producing heavy power equipment and, secondarily, they place essential electric power service at the mercy of foreign sources for maintenance and repair parts. The extent of foreign equipment purchases mostly on federal power systems, is indicated on the accompanying map.

Allis-Chalmers Mfg. Co. takes the position, as expressed by its executive vice-president, Willis G. Scholl (in a speech before the Los Angeles Electric Club), that the labor differential between the U. S. and overseas manufacturers could wreck this segment of the American industry. He contended that the taxpayer's money should be spent in ways that would aid our own economy and maintain a proportionate rate of tax income.

"One hydraulic turbine," he said, "represents the transfer of 600,000 man-hours of work from our $3-an-hour economy in which the taxes are raised to the 75¢-an-hour economy in which the money is spent . . . "In addition, it is estimated that about 250,000 other American man-hours were transferred from steel mills, forge shops, etc., to those of another country."

Map shows the geographic location of foreign-built equipment in use in the U. S.

—EW—

SWITCHEROO – Frank Pitman, ELECTRICAL WEST's regional editor in Denver, passes along this bit of intelligence.

"There's electricity in the money business in Denver. Sturgeon Electric Co. was awarded a $36,575 contract by the U. S. Mint to enlarge electrical facilities and install two induction melting furnaces."

—EW—

SERVICE—For the fourth consecutive year a mallard mother duck and her ducklings have been locked through Willamette Falls Locks at West Linn, Ore.

John P. Tatone, Willamette Falls lockmaster, said the mother duck with a brood of eight were locked through at 9 a.m. Monday, April 21, along with a flat barge from Newberg, traveling downstream.

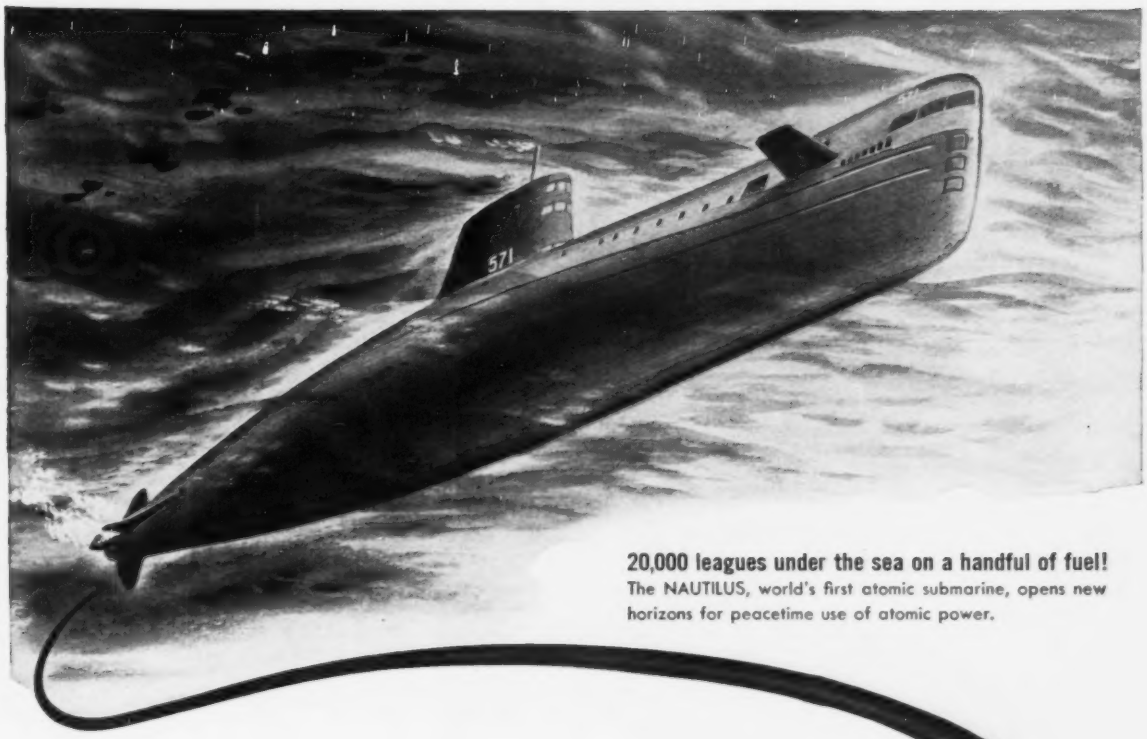
You are probably thinking about loading up the family flivver to take a vacation trip. Please drive carefully—we can't afford to lose any readers.

—EW—

UNDERPAID – Recent surveys in the fields of education and management relations brought to light some interesting and thought-provoking statistics. The U. S. Office of Education in a 102-page report on higher education planning and management data stated that "salaries of college teachers are shamefully low in the light of the crucial importance of higher education."

College and university faculty members had a 1958 average salary of $6,120 with a range from $5,110 to $8,530 for full professors in public colleges and universities. Private college and university salary scales were even lower.

The American Management Assn. reported on a survey of 102 supervisory scientists and technicians and 70 research and development scien-



20,000 leagues under the sea on a handful of fuel!
The NAUTILUS, world's first atomic submarine, opens new horizons for peacetime use of atomic power.

General Dynamics, builder of the Nautilus, is another *Carol* customer

The whole world watched when the NAUTILUS passed the fabled mark of 20,000 leagues—equivalent of more than twice around the world—powered by a handful of uranium. The Electric Boat Division of General Dynamics Corporation built the pioneering NAUTILUS, and we are proud to count them as a Carol Cable customer.

In the complete Carol line you'll find the quality cable for your special needs . . . readily available from warehouses across the country.

When you call for cable, call for Carol!

Carol®

NEMA

See us in Booth 516 N.A.E.D. Show San Francisco

CAROL CABLE COMPANY Division of the Crescent Company, Inc., Pawtucket, R. I.

Serving industry for more than 30 years

HILL POWER TRANSFORMER SERVICES

YOSEMITE NATIONAL PARK

HILL 2500 KVA Power Transformer installed in the main power house at Yosemite National Park. Unit is 3-phase, 60 cycle, OISC, class OA, 55 C, 12470 wye to 2400 delta with standard taps in accordance with NEMA-ASA and Department of Interior specifications.

POWER PLANT MODERNIZED...

HILL TRANSFORMER USED AS MAIN GENERATOR STEP-UP

Few of the millions of people who have visited Yosemite realize the Park has its own power plant, connected with the PG&E system for reciprocal service.

When the plant was modernized a HILL 2500 KVA (3-phase) power transformer replaced six single-phase units.

In installations throughout the West, HILL transformers are giving lasting service...proven performance. Built to your exact specifications, manufactured to NEMA-ASA standards, a HILL transformer assures you trouble-free service.

Power and distribution transformers—

OIL FILLED • ASKAREL • DRY TYPES up through 5000 KVA

HILL

HILL TRANSFORMER CO., INC.
1030 WASHINGTON STREET
SAN CARLOS, CALIFORNIA

tists who are enrolled in graduate evening courses at Stevens Institute of Technology. Only about 15% of the people in both groups felt that salaries were too low to promote maximum enthusiasm for their work. Factors rating highest in job satisfaction were the pleasure of doing research and the enjoyment of challenging work.

A large eastern electrical manufacturer, which queried more than a thousand engineers, found out that the group would choose, in order of importance, more privacy, more technical assistance, greater recognition and more clerical help as the most important factors that would improve the effectiveness of their particular work.

—EW—

General Electric Co. has combined its apparatus group and industrial components and materials group to "provide a more closely integrated and coordinated customer service by bringing together virtually all of the G-E divisions which manufacture and sell products for use by industrial and utility customers." Arthur F. Vinson will head the new department.

—EW—

PROGRESS—The competitive system never lacks for new challenges. Economists have been saying that coal soon will be more valuable as a source of hydrocarbons and chemicals than it will be as a fuel. Chemists are now able to extract $2 worth of chemicals from a dollar's worth of coal of certain grades. After they get through there isn't much left except a residue known as char, but that too has a certain number of Btus.

Now the engineers have developed boilers that make possible the use of char as a fuel which means that certain grades of coal, formerly too costly for power generation alone, may be used right down to the "squeal." Sounds like good business.

—EW—

ROUND PEGS—A favorite whipping boy of cartoonists and jokesters, the scientist, is not a "square" or an "antisocial hermit." The danger in allowing this misconception to flourish, even in jokes, is that it influences teen-age students to avoid scientific careers.

Recognizing this, the DuPont company conducted a serious social

science survey covering some 1,200 scientists engaged in research for the company. Contrary to popular belief, particularly among high school students, the scientist is a religious man, he is a family man, he is active in civic affairs and he likes sports.

In fact, the DuPont organization itself illustrates the type of person the scientist actually is. Of the 118 top management posts in the company, 43 are held by men who began as resea. h scientists.

—EW—

NEW PRESIDENT – Ralph J. Cordiner has been elected chairman of the board of General Electric Co. Succeeding him as president is Robert Paxton, formerly executive vice-president in charge of operations. Cordiner continues as chief executive officer of the company.

—EW—

Are you in "Who's Who in Engineering?" If you are, remember to check the information for accuracy soon and send it to 265 W. 45th St., New York 11, N. Y.

EVAPORATION CHECK – The Bureau of Reclamation and the Geological Survey are conducting research to find a technique for preventing water loss by evaporation. Hexadecanol, a waxy chemical that spreads a very thin blanket over the surface of the water, is presently being tested.

Geological Survey reports that more than 11,500,000 acre-ft of water is lost to the atmosphere annually from lakes and streams in the 11 Western states. This equals the combined capacity of Lake Shasta, Hungry Horse, Seminoe and Elephant Butte.

—EW—

In the *Cost and Profit Outlook* published by Alderson & Sessions, management consultants of Philadelphia, there was this delightful little limerick describing the dilemma of the modern executive who had been instructed by his physician to take a cocktail to relieve tension:

A man who had a thrombosis
Took liquor in rather large doses.
His heart trouble passed
But his liver went fast
And he presently died of cirrhosis.

How do you stand on Solving Business Problems?

	True	False
1. In problem solving, "brain-storming" is not a safe technique because the ideas brought to the fore this way are usually "half baked."	.....	.....
2. Business decisions have become so complicated that only the IBM boys, the operations-researchers and experts can hope to get together the necessary mass of facts to make adequate decisions.	.....	.....
3. The labs with the most equipment and the highest-paid staffs are coming up with all the ideas—the inventor type went out with Edison and Kettering.	.....	.....
4. Most problem-solving conferences which break down do so because the conferees were never really clear as to what the problem was in the first place.	.....	.....
5. The electronic digital computer has taught us a great deal about how the human brain works.	.....	.....
6. By giving up temporarily your conscious search for a solution to a problem, you increase the chances that a really new, creative idea will break through.	.....	.....
7. Some people have better minds for certain kinds of problems than do others. This doesn't mean that their over-all intelligence is necessarily greater, but that their memory storage and patterns of thought are different.	.....	.....
8. Groups often solve complicated problems better because the interplay of ideas and personalities produces a more intense effort.	.....	.....
9. A top-flight man should choose for himself the problem he prefers to tackle.	.....	.....

(Answers on p 125)

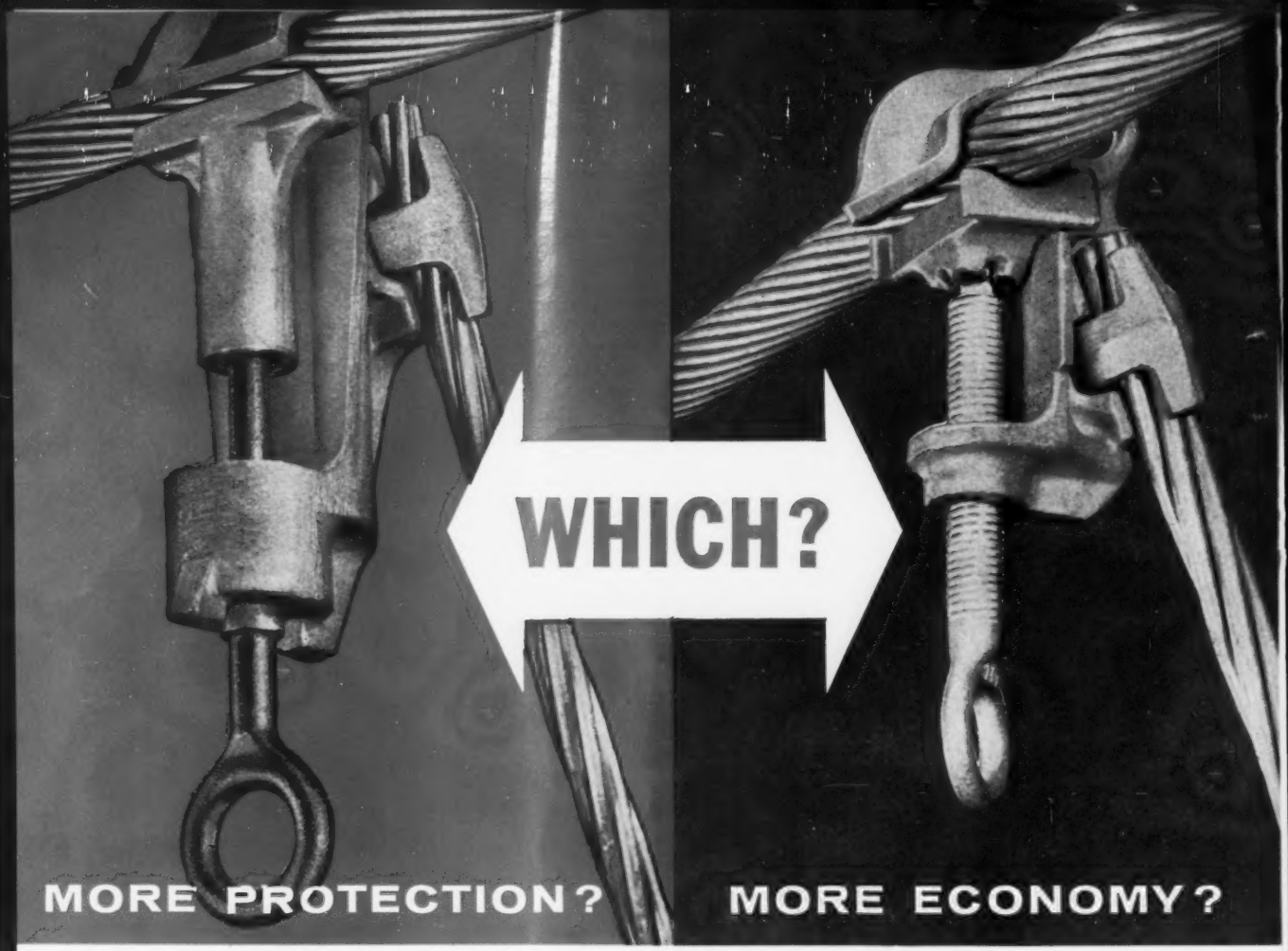
ONLY ONE IN THE WEST

HILL's newly expanded facilities provides electric utilities in the West their only source of distribution transformers in a full line, designed and built in the West by a wholly-Western owned manufacturer.

Complete standard range of 3 to 500 KVA distribution transformers are now in regular production. Power and distribution transformers—Oil Filled, Askarel and Dry Types—are available through 5000 KVA. Manufactured to NEMA-ASA standards, HILL transformers carry a five year guarantee.

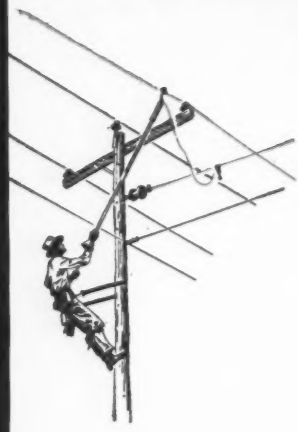
For complete information see your nearest representative or write direct for Catalog No. 2000.

HILL TRANSFORMER CO., INC.
1030 WASHINGTON STREET
SAN CARLOS, CALIFORNIA



(HLP Enclosed Thread Spring Compensated Clamp: 4 clamps — #6 solid to 636 MCM ACSR)

(HL Open Thread Clamp: 5 clamps — #8 to 1431 MCM ACSR)



Now...Two New Hot Line Clamps

Take your choice of Anderson's two new series of hot line clamps: the extra protected HLP, or the economical HL. Both come in cast aluminum or plated aluminum, and both have basically the same rugged, long-life features: (1) Large area, high pressure main and tap contacts on the same casting for full current flow, low resistance. (2) Massive plated bronze eyebolt terminals, designed to pass the Mercurous Nitrate Test, insure protection from season cracking and stress corrosion. (3) Extended "duck-bill" upper contact and deep cable seat make quicker installation, prevent cable "walk-off" during installation!

HLP "extras" are a heavy duty, Vanadium Steel-plated multi-coil spring and a threaded, permanently inhibited chamber to assure an arc-proof and corrosion-proof eyebolt stem. Completely housed in the main casting but away from the current path, the spring compensates for cable cold flow, temperature changes, relaxation, heavy fault currents. Much higher contact pressure with the same eye-stem torque results from the new in-line pressure mechanism. So, take your pick. Both the HL and HLP do the job, are simple to install, and ruggedly built for extra long life.

ANDERSON ELECTRIC CORPORATION
Birmingham 1, Alabama

Export Representative: International Standard Electric Corp.
50 Church Street
New York 7, New York

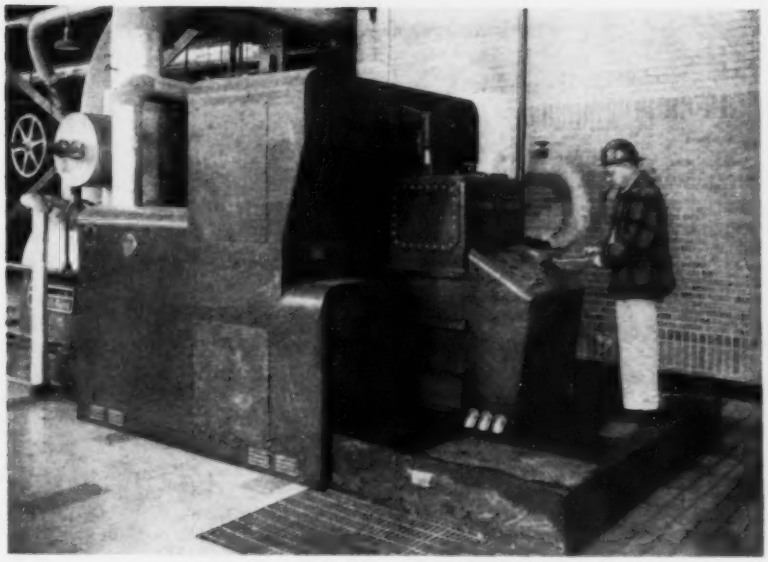
ANDERSON ELECTRIC

Research / Quality / Performance / in Aluminum and Bronze Products

Aluminum and Bronze Power Connectors • Clamps • Fittings • Accessories for SUBSTATION • TRANSMISSION • DISTRIBUTION

PRODUCT NEWS

New Designs and Applications



First use of the new-type boiler feed pump turbine is by Appalachian Electric Power Co.

Boiler Feed Pumps

(1) *General Electric Co., Schenectady 5, N. Y.*

Boiler feed pump turbines that can operate up to 12,500 rpm, with outputs from 1,000 to 15,000 hp, are being more frequently used in connection with steam turbine-generator units of 200,000 kw and up. Because of the growing interest, G-E is conducting an education program for both its field sales force and a number of electric utilities. The education is needed concerning mechanical drive turbines as utilized in the pulp and paper, chemical, petroleum and petrochemical industries, as well as utility applications. You can secure a "facts and features" kit about utilization of the units.

Warning Light-Barricade

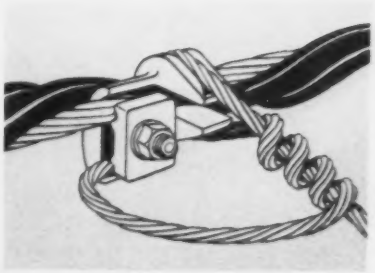
(2) *Neo-Flasher Mfg. Co., 3210 Valhalla Dr., Burbank, Calif.*

This company is manufacturing a combination transistor warning light and collapsible barricade unit for utility use around street work areas. The flashing units have no moving parts, and operate on two 6-v lantern cell batteries for 2,200 hours.

Tubular Bus Clamp

(3) *Anderson Electric Corp., Birmingham 1, Ala.*

This company has developed a new tubular bus clamp designated type AUR. A spaced dual clamping feature provides support over a longer stretch of bus, and maximum spacing of support over a longer stretch of bus, and maximum spacing of support points can therefore be increased. It is made of high-strength, heat-treated aluminum alloy, with aluminum hex head clamping bolts and galvanized steel mounting bolts.



Neutral Connector

(4) *Dossert Mfg. Corp., 249 Huron St., Brooklyn, N. Y.*

Intended for use with triplex secondaries and service drops, this new neutral fitting is a connector that is said to be suitable for a wide range of other applications. It may be used singly or in groups of two or more for any number of service drops in any direction. The design combines features of two well-known devices, a parallel groove clamp and a thimble. The manufacturer says that connector grooves have been carefully designed to prevent nicking or other damage to either conductors.

Aluminum Conductor

(5) *Kaiser Aluminum & Chemical Sales Inc., 919 N. Michigan Ave., Chicago 11, Ill.*

After three years of laboratory and field testing in coastal and inland locations throughout the nation, this company is making available a new all-aluminum alloy conductor (AAAC). Designed for overhead distribution systems, AAAC is said to have the strength and electrical properties of ACSR, costs the same on a footage basis, and offers installation, upkeep, performance and economic advantages, according to the company. The new solid or stranded conductor is available bare, covered or insulated in AWG sizes from No. 6 on up. Multiplex cables are available. Applications include urban primaries, secondaries, multiplex cable neutrals for duplex, triplex and quadruplex service drops, and municipal street lighting systems.

have your

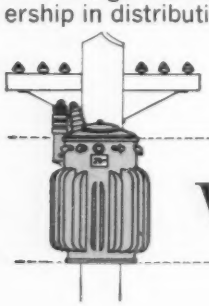
Westinghouse representative

tell you how you can

HANDLE PRESENT DISTRIBUTION LOADS LONGER ...NO ADDITIONAL INVESTMENT

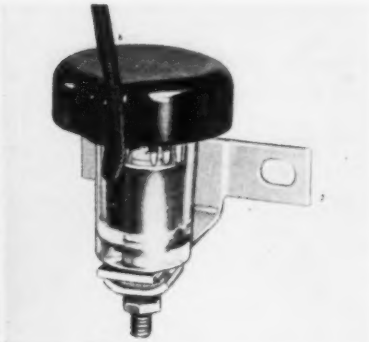
Now—the Insuldur® insulation system assures you of increased transformer life, without additional cost . . . Another answer to changing needs because Plowback of earnings into research maintains Westinghouse leadership in distribution transformer development.

J-70846



YOU CAN BE SURE...IF IT'S

Westinghouse



Secondary Arrester

(6) *Line Material Industries, Milwaukee* 1, *Wis.*

This company offers a new secondary arrester designed to provide lighting protection for low-voltage equipment, secondary distribution circuits, control circuits and signal circuits in the range of 0 to 650 v a-c. The spark gap consists of a multiple-point electrode spaced by high-dielectric ceramic. A Pyrex housing permits visual inspection of spark gaps and valve elements.

Metal Enclosed Switchgear

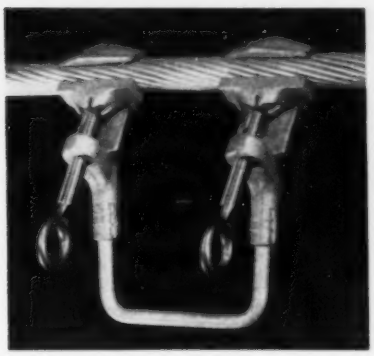
(7) *Line Material Industries, Milwaukee* 1, *Wis.*

Metal enclosed, power class recloser switchgear, said to be the first ever offered to the electric power industry, is announced by this company. The units can be applied on circuits rated 2.4 through 15 kv. Bus continuous current ratings are 800, 1,200 and 2,000 amp. Impulse level is 110 kv. Recloser continuous load ratings range from 25 through 560 amp. Interrupting capabilities up to 8,000-rms amp at 14.4 kv.

Cutouts

(8) *A. B. Chance Co., Centralia, Mo.*

A new porcelain enclosed cutout with a door that can be installed and removed from any angle with a standard hookstick has been announced by this company. Interrupting capacity ranges from 2,000 to 10,000 amp, and fuse operation is visually indicated by either an indicator flag or 180° drop-out action. Contact, terminals, hinge trunnion and mounting hanger are cemented to the housing with epoxy resin. This cutout is made in the complete range of NEMA ratings in 5.2- and 7.8-kv, 50- and 100-amp cutout models and 100- and 200-amp disconnecting-cutout models.



Stirrup Clamps

(9) *Anderson Electric Corp., Box 2151, Birmingham 1, Ala.*

A new series of hot line stirrup clamps is being produced by this manufacturer. They are usable with either copper or aluminum main secondaries. The stirrup clamps have two individual contact pressure mechanisms, and can be supplied with either hex head bolts or eye stem bolts. In either case, the gripper is always permanently attached to the stem. Use of these stirrup clamps is recommended for protection of the main cable from arcing, pitting, burning and mechanical damage caused by recurring tap disconnections.

Pancake Motor

(10) *Louis Allis Co., Dept. P, 427 E. Stewart St., Milwaukee 1, Wis.*

This company has designed a motor that reduces motor length up to 60% from standard motors of the same rating. It is designed for use on machine tools, roof-ventilating fans and other space cramped applications. It is a flange-type motor of conventional radial air-gap design. It achieves its short length through formed end coils and a one-piece housing-bearing bracket. Complete information is contained in bulletin 2100.

Plastic Wire Cover

(11) *Fanner Mfg. Co., Brookside Park, Cleveland 9, Ohio*

A new, low cost plastic molding that is said to be practically indestructible has been developed by this company for covering ground wires, street lighting conductors, control circuit wiring and other applications where wiring needs protection. The cover is made of high impact shock resistant plastic in popular sizes. Said to require less space than comparable wood moldings, and can be stored in less than 20% of the space required by wood moldings. Furnished regularly in 8-ft lengths, packed in convenient, protective cartons.

Program Time Switch

(12) *Tork Time Controls Inc., Mount Vernon, N. Y.*

A program time switch with 96 tabs fixed to its 24-hour dial to permit 15-minute switching changes has been announced by this company. Tabs are manually tilted in or out to set. Tilting is done by hand, and no tools are required for adjustment. Recommended for daily ON-OFF program for ventilating fans, heating, irrigation systems, recorded music or many others. Minimum ON or OFF time is 15 minutes. Maximum is 23 hours, 45 minutes. Skip-A-Day feature is available as optional equipment.

Now . . .
stop line outages
caused by birds
and squirrels . . .

NEW PLASTIC
COATED
COVERS ON
WESTINGHOUSE
DISTRIBUTION
TRANSFORMERS

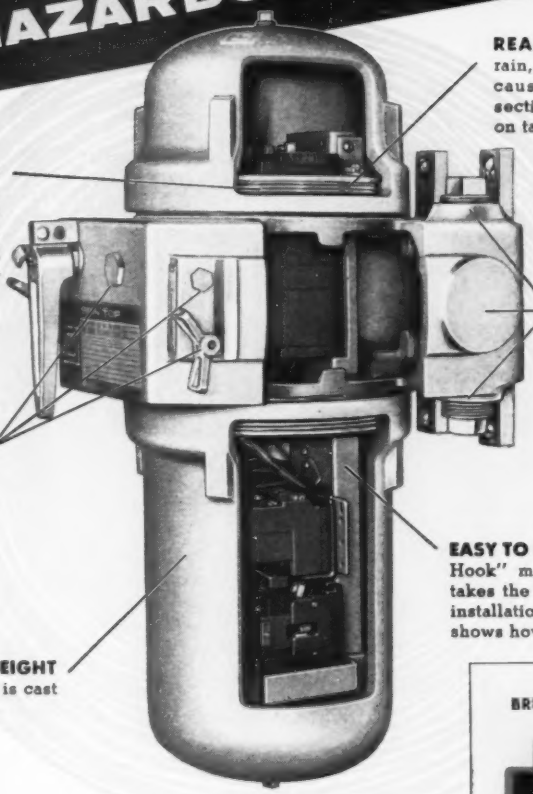
Have your Westinghouse representative give you the full story about . . . another answer to a changing need.

J-70845

YOU CAN BE SURE . . . IF IT'S
Westinghouse

Square D announces...

NEW SPIN TOP ENCLOSURE FOR HAZARDOUS LOCATIONS



REAL PROTECTION against rain, dust, dirt and weather because male threads on collar section engage female threads on tank.

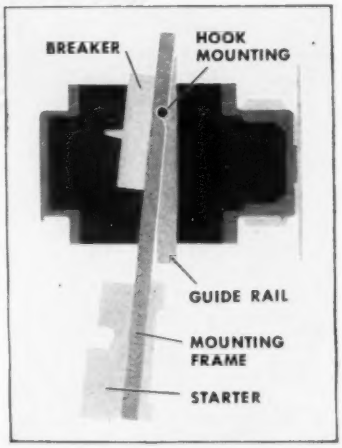
DAMAGE-RESISTING Acme thread. If you've struggled with "banged-up" threads, you'll appreciate this feature. It's always a breeze to put on and take off tanks for installation, inspection or maintenance.

INCREASED WIRING SPACE and through-feed conduit entrances for horizontal tap-offs.

EASY TO ADD pushbuttons or selector switches with easy-to-buy, easy-to-use "off-the-shelf" parts kits.

EASY TO INSTALL • "Slide and Hook" mounting arrangement takes the hard work out of the installation job. Diagram below shows how.

STRONG and LIGHTWEIGHT The complete enclosure is cast aluminum.



SLIDE and HOOK MOUNTING

4 SIZES FOR STARTERS SIZE 0 THROUGH 5

CLASS I, GROUP C and D • CLASS II, GROUP E, F, and G

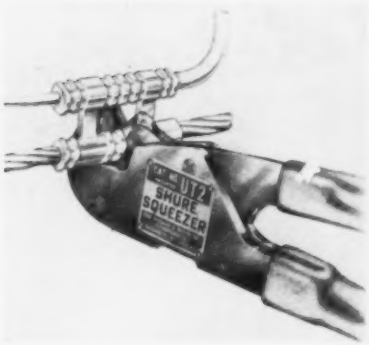
The new **SPIN TOP** enclosure is available from your Square D Distributor in three ways—complete device, enclosure only, or components only...for reversing and non-reversing across-the-line starters and combination starters. And for combination and non-combination two-speed starters.

Write FOR BULLETIN 9990

Square D Company, 4335 Valley Boulevard, Los Angeles 32, Calif.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY



Double Tap Connectors

(13) *Thomas & Betts Co., Elizabeth, N. J.*

New single- and double-tap connectors that also can be used as dead-ends and stirrups have been added to the complete line of compression-type electrical connectors offered by this company. The connectors are installed with a positive acting pocket-size tool that can be operated with one hand. They are designed for use on all aluminum and aluminum to copper connections, the company reports. The line also includes right angle tap connectors and pin terminals for connecting aluminum and ACSR to copper equipment terminals.

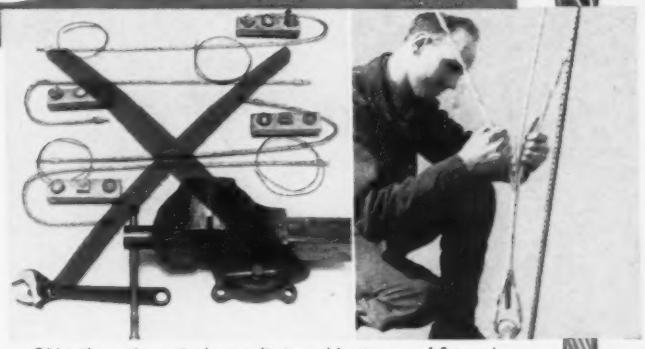
Terminal Method

(14) *Minnesota Mining & Mfg. Co., Department D8-158, 900 Bush St., St. Paul 6, Minn.*

This company claims time saving of 50% over conventional methods by using a new method for making shielding, high-voltage terminals insulated with epoxy resin. The new method uses predesigned terminal shields of heavy plastic slipped over a plastic tube closed with a stepped-end cap to fit various cable sizes. The terminal shields are cone shaped and are of the building-block or interlocking type. They are slipped on the body tube to form a stack of shields appropriate for the operating voltage of the cable. Each terminal shield is rated at 5 kv, and may be used in combination up to 15 kv. Making the termination is a five-step operation. Full step-by-step information is available from the manufacturer.

For additional information, fill in coupon on page 22.

UP TO 49% $AVINGS
on materials alone
with
Fine Fanner Superformed
FANN GRIPS
FOR DEAD-ENDING GUY STRANDS



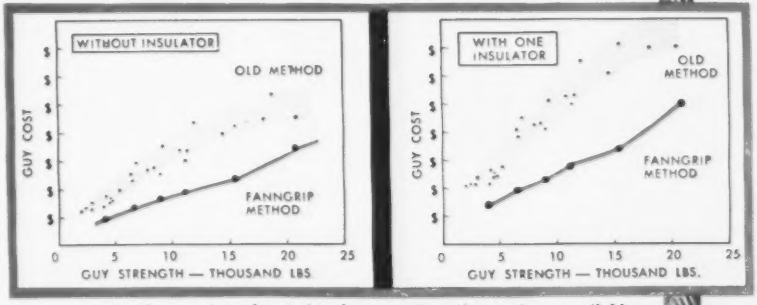
Old style costly methods are eliminated by the use of Fanngrips.

Now . . . costs compiled from typical guying methods using Fanner Fanngrips in comparison to other types of gripping devices show savings up to 49% *in materials alone* . . . in addition to the tremendous savings in time and labor!

Now . . . when savings are so important . . . here is more reason than ever to take advantage of the many Fanngrip features offered by no other type of gripping device:

- Provide maximum strand strengths.
- Eliminate laborious field fabrication.
- Self-clamping, permanently tight.
- Heavy coatings protect from corrosion.
- Do not damage guy strand surfaces.
- Dangerous and wasteful strand ends eliminated.
- Available in "B" or "C" coated galvanized steel, or copperweld.

Ask for cost-saving data today!



Two of a series of graphs demonstrating the savings available through Fanngrips over ordinary gripping methods.

Licensed for use under patent Nos. 2,275,019 and 2,587,521

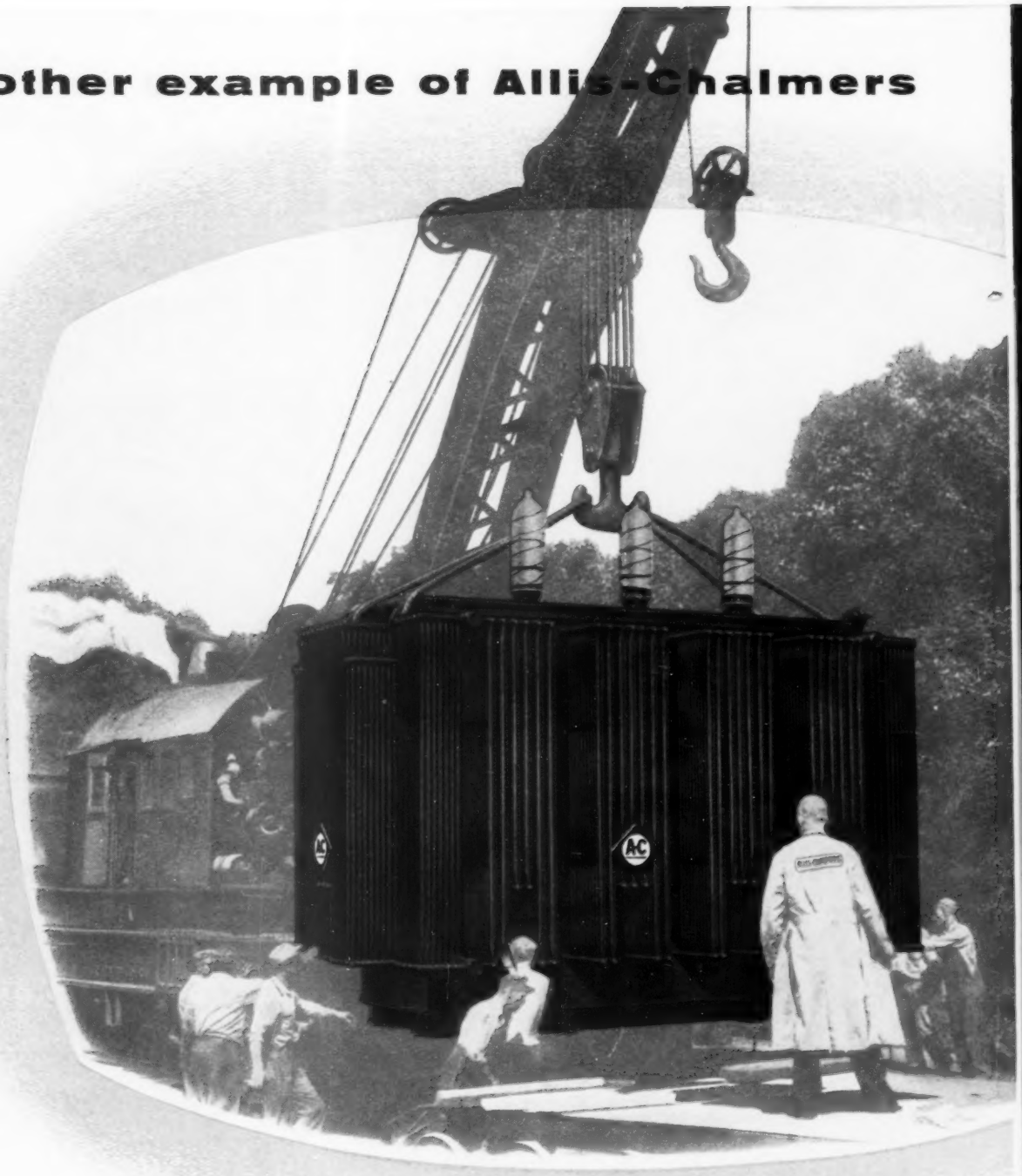
Fine Fanner Superformed Products

THE FANNER MANUFACTURING COMPANY
Division of Textron, Inc.
BROOKSIDE PARK • *Established 1894* • CLEVELAND 9, OHIO
Telephone: SHadyside 1-6000 TWX: CV39

AGENTS and DISTRIBUTORS IN PRINCIPAL CITIES

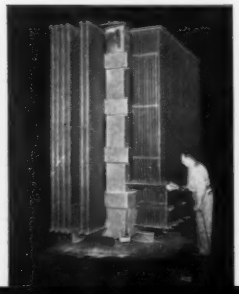
ARMOR RODS · LINEGUARDS · TAP ARMOR · PATCH RODS · FANNGRIPS
PLASTIC FANNGUARDS · PLASTIC INSULATING TUBINGS AND MOLDINGS

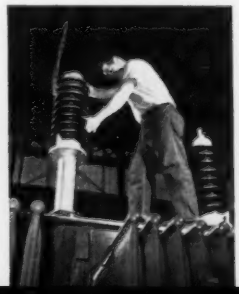
Another example of Allis-Chalmers



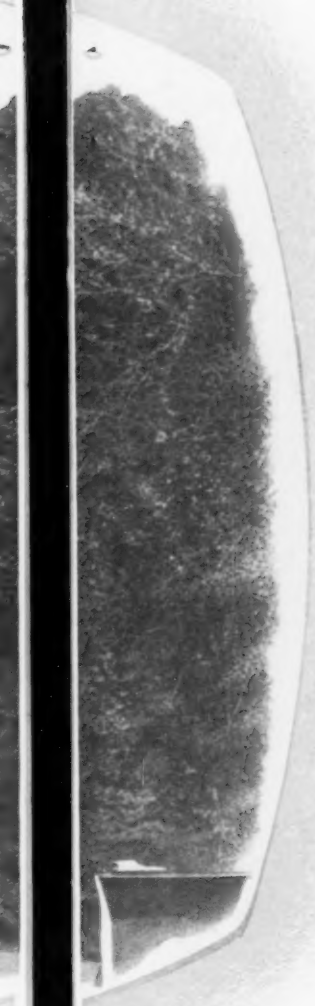
Balanced Design Once an Allis-Chalmers transformer is on the line, you can look forward to years of extra dependable service because *Balanced Design* includes: *Corona-Free* insulation, high impulse strength, uniform cooling, high short-circuit strength, weather-tight construction . . . and many other superior features. Ask your A-C man for all the details, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wis.

Welded-on radiators are pressure-tested at the factory. Bushings are also installed at the factory to reduce installation time.





leadership in transformers



Large factory-assembled transformers moved from train into position and...

on the line in less than 4 hours

A. J. Becker
Field Engineer

"MANY engineers are pleased to learn how quickly large power transformers can be installed. When you check the timesaving features of Allis-Chalmers transformers, the reasons for fast and easy installation become obvious."

Factory assembly where shipping clearances permit is one important reason. Factory-installed radiators and bushings leave nothing to be done at the site except grounding the tank, connecting high and low voltage bushings, and completing system electrical test checks. Building transformers as large as 20,000 kva using this construction has become routine at Allis-Chalmers.

Ski-base helps save time also. It permits rolling or skidding in any direction. Turned-up ski ends ride smoothly on all types of rollers without gouging or digging in. Eyeholes in the corners of the base make winching into position easy. Corner jack lugs are designed with ample clearance, and are clear of cooling tubes.

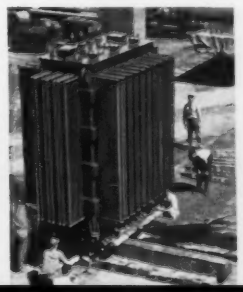
Another reason behind fast installation is the nation-wide staff of experienced Allis-Chalmers field engineers . . . like A. J. Becker, with 36 years of experience inspecting, testing and installing A-C transformers. These men *know* transformers. They offer on-the-spot guidance to make installation smooth and quick.

A-C

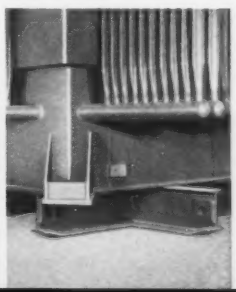
ALLIS-CHALMERS

A 5694

Ski-shaped base of heavy I-beam cross supports permits moving in any direction. Reinforced clevis hole gives extra tow strength.



Ample jacking clearance and working space plus broad, flat surfaces for lifting jacks save hours of installation time.



BULLETINS ETC.

(15) **LIGHTING FIXTURES**—A new booklet describing the complete line of Sylvania lighting fixtures and lighting systems has been released by the fluorescent fixture operation of Sylvania Electric Products Inc. It contains 56 illustrations of industrial, commercial and residential fixtures and systems. Write to Sylvania Lighting Products, 48th St., Wheeling, W. Va.

(16) **FLUORESCENT BALLASTS**—Bulletin GEC-983L by General Electric Co., Schenectady 5, N. Y., gives prices and data on 184 ballasts for fluorescent lamps. Included are a "Quick Guide to CBM Ballasts," descriptive tables, cross section dimension diagrams and chart for suggested replacement. Also contains installation and operating instructions, and wiring diagrams.

(17) **LIGHTING**—New explosionproof and dust-ignitionproof mercury vapor lighting fixtures are described in Crouse-Hinds bulletin 2705. The bulletin lists explosionproof fixtures with five styles of reflectors, all available with or without guard. Write the company at Syracuse 1, N. Y.

(18) **TRANSFORMER**—A two-color, illustrated catalog describing the newly designed over-all self-protected transformer is now available from Delta-Star Electric Division, H. K. Porter Co. Inc., 17th & Cambria Sts., Philadelphia 32, Pa.

(19) **OIL CIRCUIT BREAKERS**—Three integrated construction features that provide dependable protection, long life and low maintenance are described in a new large outdoor oil circuit breaker bulletin released by Allis-Chalmers Mfg Co., Milwaukee 1, Wis. Ask for bulletin 71B6022D.

(20) **GAS TURBINES**—Combusion gas turbines in a wide range of kw ratings for diverse applications in the electric utility industry are described in General Electric Co.'s new publication GED-3603. Write for your copy to Schenectady 5, N. Y.

(21) **ISLAND LIGHTER**—A four-page product folder on the new 9700-series fluorescent island lighter for service stations is available on request from Revere Electric Mfg. Co., 7420 Lehigh, Chicago 31, Ill.

(22) **CHOOSING BULBS**—"How To Judge A Light Bulb" is the title of a new booklet just issued by Westinghouse Lamp Division. The pamphlet contains numerous facts about light bulb life, light output and cost of light. Send your request to the Lamp Division at Bloomfield, N. J.

(23) **CIRCUIT BREAKERS**—Complete information for the use of current-limiting circuit breakers for short-circuit protection on low-voltage systems is given in a new bulletin published by I-T-E Circuit Breaker Co., Philadelphia 30, Pa. Cordon circuit breakers, with an interrupting rating of 100,000 amp, combine in one device the conventional overcurrent tripping features of molded-case circuit breakers, and current-limiting ability of Chase-Shawmut Amp-traps.

KILL TWO BIRDS WITH ONE STONE—Fill out this coupon and get back valuable information from as many sources as you indicate.

ELECTRICAL WEST *not good*
68 Post St., San Francisco 4, Calif. *after August 1*

Please send me, without obligation, the new product information or catalogs:

If described in Product News, circle item number

1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22 23

If described in advertising, fill in page number

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NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

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*Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

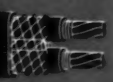
BRONCO 66 CERTIFIED

quality flexible large electrical cables FOR SAFE, CONTINUOUS DUTY UNDER EXTRAORDINARILY RUGGED CONDITIONS

JACKET is certified by a registered professional engineer to contain not less than 67.32% Neoprene for maximum protection against oil, ozone, acids, flame...

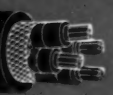
BRANDED, permanently, with complete data every two feet.

P.I.66M branded into these jackets is the symbol for official approval by the Pennsylvania Bureau of Mines and acceptance for listing by the Federal Bureau of Mines.



FLAT TWIN PARALLEL

600 Volt cable is designed especially for use on the take-up reels of mine locomotive and mine machinery. It is made in both W and G types in sizes from 8 a.w.g. through 4/0 with either coarse or fine stranding.



HIGH VOLTAGE — 2001 to 15000 VOLTS

Bronco 66 Certified is made as both Type W and Type G portable cables. It is available in sizes 8 through 1 with three or four conductors, with flexible or extra flexible stranding. In Type SH it is available from 600V to 15KV both shielded and unshielded.

RETRACTABLE REEL CABLES

are 600 Volt cables made with special reinforcement for prolonged service on the payout and retractable reels used with lifting magnets, mine trailer cables, dragline cables, etc. Made in sizes 8 through 1 with 2, 3, or 4 conductors.

ORDER THE LENGTH YOU REQUIRE. IT WILL BE SUPPLIED AT NO ADDITIONAL COST.

SALES OFFICES IN ALL PRINCIPAL CITIES

15 LOCAL AND 3 CENTRAL SERVICE CENTERS THROUGHOUT THE COUNTRY... OVERNIGHT SERVICE TO ANY CITY IN THE COUNTRY.

WESTERN INSULATED WIRE CO.

America's largest privately operated manufacturer of portable electrical cords and cables.

LOS ANGELES 58, CALIFORNIA

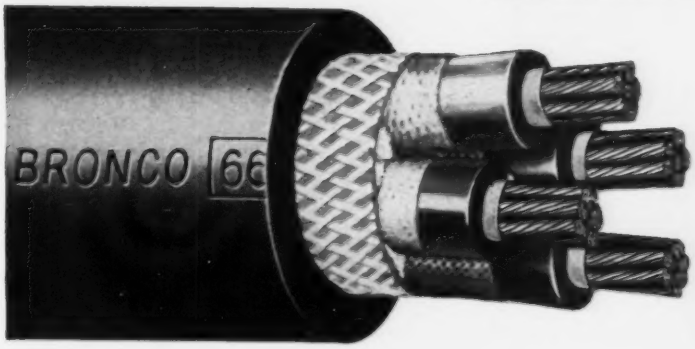
FLAT TWIN PARALLEL TYPES W&G MINING CABLES

HEAVY DUTY BRONCO 66

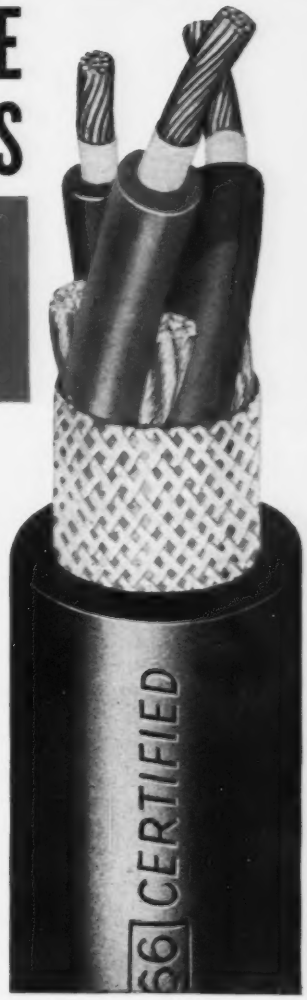
CERTIFIED

67.32% NEOPRENE JACKET

LARGE CABLES



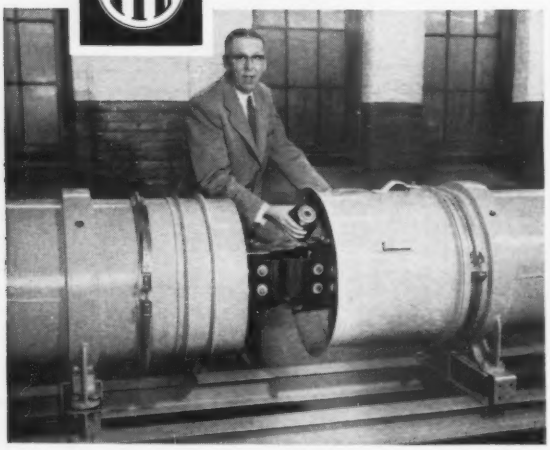
HIGH VOLTAGE TYPES W, G, AND RR CABLES



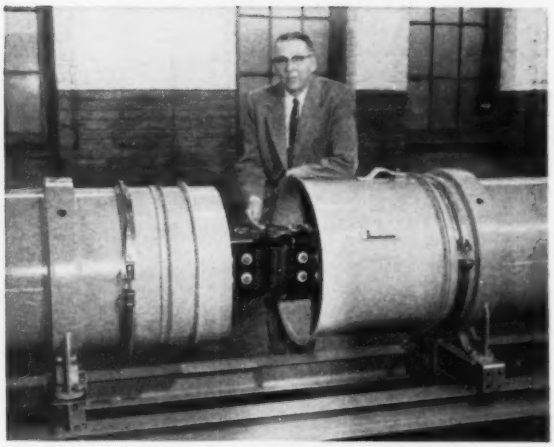
RETRACTABLE REEL CABLES

Bronco 66 Certified Types W, G, and Control Cable are described in detail in the Bronco catalog. Write for free copy.

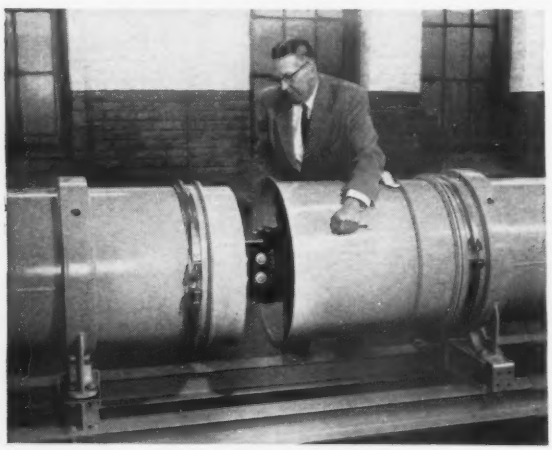
ISOLATED PHASE BUS



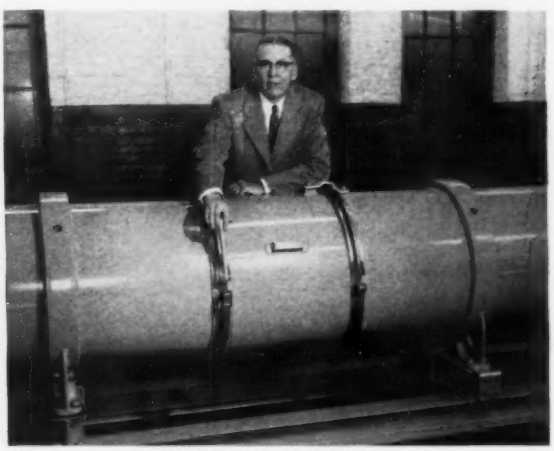
Sliding cover in open position. Connectors are easily accessible for assembly and maintenance. High-strength wet porcelain insulators, mounted in compression, are easily reached for inspection and removal.



Connectors can be either bolted or field welded. When bolted, Belleville washers are used to maintain adequate contact pressure. Conductors are either copper or aluminum. All copper connections are silver plated.



Sliding cover in partially closed position. Flanged cover, flanged rings, lifetime silicone rubber gaskets and clamping bands provide a positive seal, prevent dust accumulation, simplify opening and closing.



Sliding cover in closed position. Closure requires only two 1-piece lifetime silicone rubber gaskets—easy to place and remove. Simple, powerful V-clamp band exerts pressure uniformly around the flanged rings.

How I-T-E Sliding Covers Reduce Installation and Inspection Time

Sliding covers, well located, to facilitate joint makeup and inspection are one of the many money-saving advantages of I-T-E Isolated Phase Bus. Others include the most simple and efficient of designs; greatest installation flexibility; light weight to save installation time, labor cost, and structural steel; quick, reliable engineering; and excellent delivery.

I-T-E Isolated Phase Bus is available in ratings through 138 kv, through 20,000 amp. Self and forced-air cooled. Send today for Bulletins 10004-A and 10004-B, giving complete information. I-T-E Circuit Breaker Company, Switchgear Division, 19th & Hamilton Sts., Philadelphia 30, Pa. In Canada: Eastern Power Devices Ltd., Toronto, Ontario.

I-T-E CIRCUIT BREAKER COMPANY
PHILADELPHIA, PENNSYLVANIA

No. 6 in a series

Right off the Wire

A computer-controller system is said to be capable of landing 120 jet planes per hour. Human control can average no better than 40 per hour.

Dockside facilities at SIMPLEX' Submarine Cable Division in Newington, N. H. are extensive enough to continuously load two of the largest submarine cable ships simultaneously.

A new plant is reported to cut the manufacturing time of industrial carbon components from eight weeks to eight minutes.

A "building block" technique, using miniature plug-in units, makes it possible to build an electronic computer small enough to go on an office desk.

An iron-aluminum alloy has been made, the behavior of which indicates that there is a relationship between rusting and magnetism.

Some fruit trees have been found to ripen earlier after long exposure to gamma radiation.

At least one of the new "exotic" rocket fuels is being made in solid form and others are expected soon.

A patent has been issued for a radioactive "go-devil" (a device for cleaning pipe lines). If it sticks in a pipe it can be located with a Geiger counter.

It is estimated that malicious damage to street lamps costs New York City a quarter of a million dollars a year. A new plexiglas globe makes this sort of vandalism almost impossible.

Instead of the usual bracing and shoring, inflatable cushions are being used to wedge freight tightly in box cars.

One of the new guided missiles is launched from an automatic base which computes the location of the attacking object, calculates its speed and the proper point for meeting it. It also loads and fires the missile automatically.

A micro-porous synthetic material holds a liquid, such as an ink or lubricant, and gives it off at a controlled rate.

Damage to small delicate parts on a conveyor can be avoided by a new belt that uses permanent magnets to hold the pieces apart.

Glass-reinforced plastics can be strengthened by the use of a special new glass containing copper oxide.

Further information on these news items and on Simplex cable is available from any Simplex office. Please be specific in your requests.

A new wool-like synthetic fiber is water-repellent, quick-drying and less expensive than other synthetics.

A device for measuring the power output of a turbine involves an inner and an outer gear in constant mesh with free space between the teeth. This space is filled with oil on which the pressure can be measured.

Simplex Wire & Cable Co. was the first to adapt interlocked armor (CONDEX) for use with underground cable in 1924.

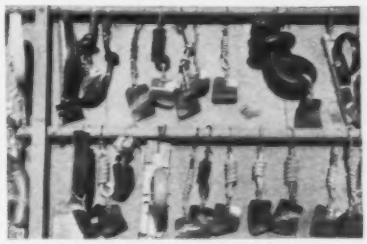
A logging company is using plastic nails to fasten logs together. They neither rust nor damage saw blades.

Paralyzed fingers can be made to move by means of tiny artificial muscles powered by a carbon dioxide cartridge.

Research conducted by two Simplex scientists in the early 1920's resulted in the first truly moisture-resistant rubber insulation. The isolation and removal of the proteins that are always present in natural rubber was the basis of the now famous ANHYDREX family of insulations.

Foamed aluminum is being made for use as a core in sandwich construction.

An electronic device checks the accuracy of aircraft guns without firing them.



Rooftop Laboratory

These cable samples, twisted and bent to exert maximum stress on insulations and jackets, are undergoing sun-crack endurance tests atop the Simplex plant at Cambridge. Many of these samples have been exposed to the elements for as long as fifteen years . . . and they haven't cracked yet. This is one example of the many punishing tests which Simplex insulating and jacketing compounds, such as Anhydrex, Thermoplex and polyethylene, are subjected to before they win final approval.

It's all part of a comprehensive system of quality control which has helped make Simplex the leader in cable research and manufacture.

SIMPLEX WIRE & CABLE CO.
Cambridge, Massachusetts and
Newington, New Hampshire

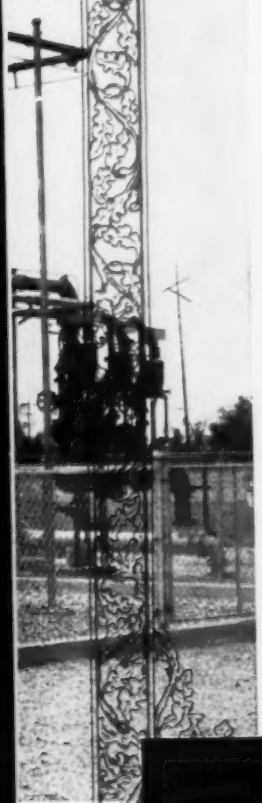
Simplex

Highest quality cables for: Mining • Power & Lighting • Construction • Transportation • Communications • Signalling

"The American manufacturers of transoceanic telephone cables"

MOLONEY ELECTRIC COMPANY

INSTALLS A MOLONEY 135,000 KVA STEAM-ELECTRIC GENERATING STATION



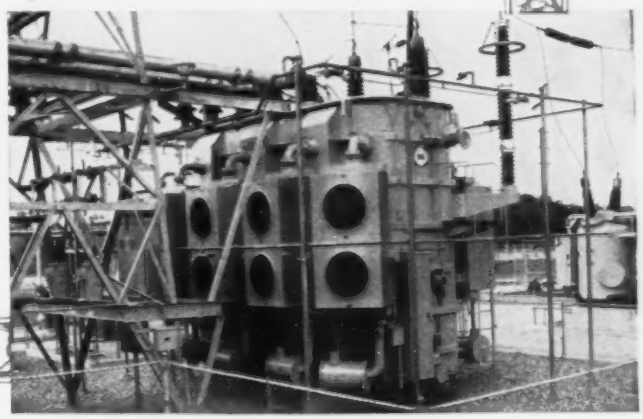
Another Example of Moloney's Abilities and Facilities Working with Utilities to Meet Specific Customer Requirements

The Michoud Station, now in operation, presented problems in the planning stage which required cooperation in the design and manufacture of component equipment. In the case of the transformer, one of the main components in this 13 million dollar plant, New Orleans Public Service Inc., required a 135,000 KVA, three-phase, sixty cycle, class FOA Transformer, H.V. 115,000 GRD. Y/66400 volts and L.V. 13,800 volts delta. It is the main station transformer connected directly to the generator. Customer's specific requirements had to be met in developing the design.

Michoud Station is an important link in the expanding facilities that New Orleans Public Service Inc., must provide to assure its customers of ample, dependable service and Moloney is proud to have furnished a major component of this installation.

MX88-18

Your nearest Moloney representative will be glad to explain in detail how Moloney can supply any size transformer you may require. Contact him today.



Manufacturers of Transformers for Utilities, Industry, and Electronic Applications

FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA
SALES OFFICES IN ALL PRINCIPAL CITIES

Every VAREX Capacitor Gets this Two-Way Protection

① DURABLE EPOXY ON THE CASE

Epoxy-resin paint used on Varex is most durable finish commercially available for this class of material.

② PACKAGING PROTECTION RIGHT UP TO THE POLE TOP

Extra-heavy carton has gross rating of 160 pounds, more than 40 pounds above heaviest 50-KVAR unit.

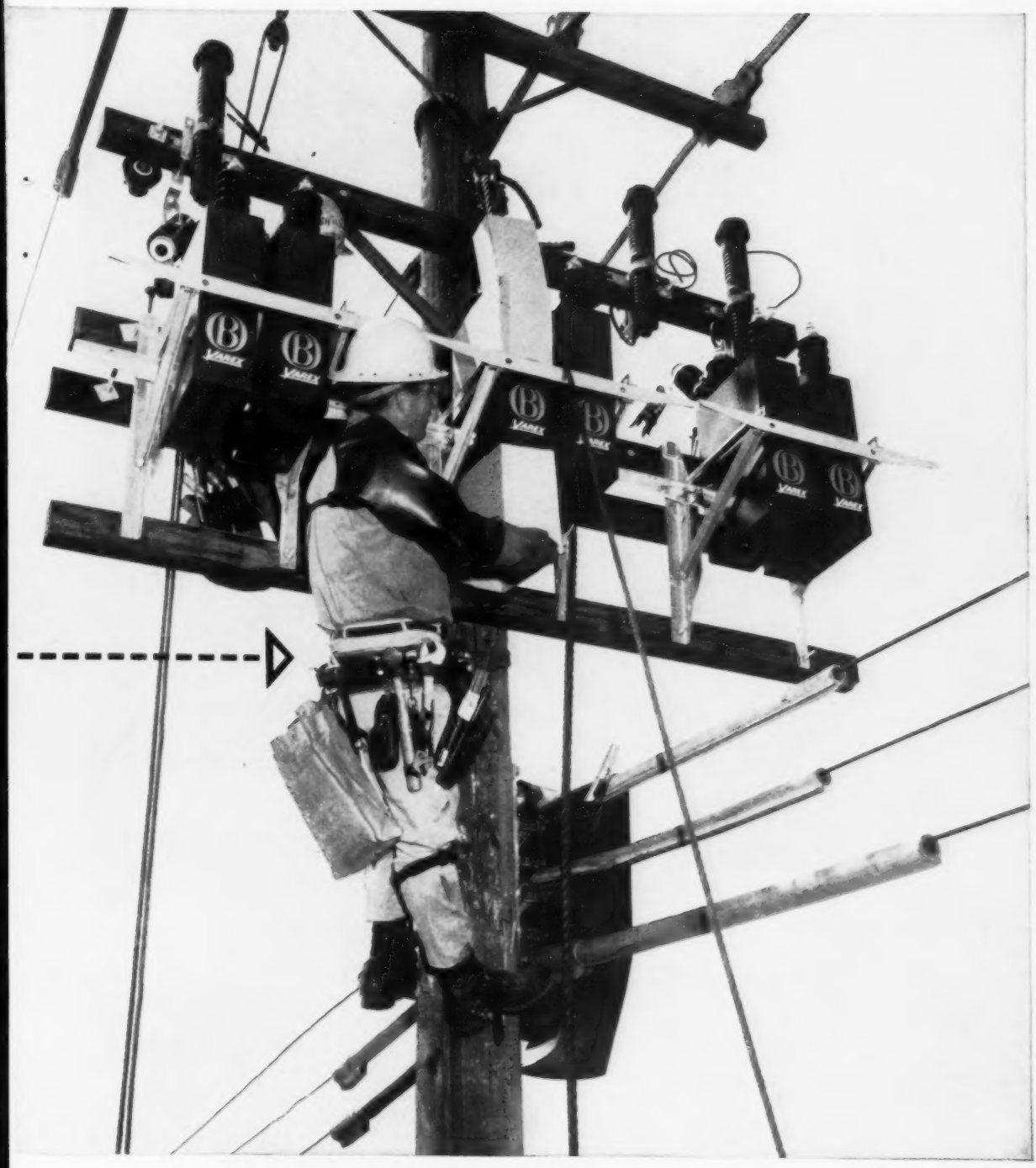
At the end of the assembly line, each Varex unit is packaged in a carton having a gross weight rating of 160 pounds. Inside the carton are a special split liner that fits around the capacitor case, two liners that fit over the bushings, and heavy spacers that reinforce the carton and give extra protection at the narrow sides of the unit.

All this protection can be left intact until arrival at the installation site. Then the outer carton is removed but the inner liner is left in place, and can be left in place until the unit is bolted in place.

But the real protection is just beginning. For underneath the carton liner is special epoxy-resin finish used on all Varex cases. This is the new finish — available only on Varex—that has been proved superior to other resin base paints on corrosion resistance, abrasion resistance, flexibility and adhesion.

You get this two-way protection with every Varex capacitor — 1) complete protection against weather after the unit is installed; 2) protection against damage in handling right up to the pole top.

OHIO BRASS COMPANY, MANSFIELD, OHIO



Ohio Brass

Along today's modern highways easy-to-handle J-M Transite Ducts provide installation economies and years of service life, protecting traffic-signal, lighting, and other power-service circuits.

J-M Transite® Ducts install fast to last... give complete cable protection.

Because speed and economy set the pace in today's highway programs, more and more highway cables are going into Johns-Manville Transite Ducts.

For speed, Johns-Manville Transite Ducts are strong, light and long—easy to handle and install. Workmen set 10-foot lengths in place easily, join them up tight in seconds with snug-fitting J-M Plastic Couplings, and Transite's smooth bore is free of burrs and other obstructions that may interfere or cause damage during pulling of cables.

For economy, J-M asbestos-cement Transite Ducts go in to stay. Non-conductive Transite is not affected by electrolysis—resists the corrosive action of fills or high-salt soils in permanently damp locations. Millions of feet of installed Transite Ducts have proved that Transite withstands earth loads and soil stress . . . resists vibration and shock from highway traffic.

Let us send you free Transite Duct brochure EL-29A. Write Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

JOHNS MANVILLE JM PRODUCTS

Johns-Manville Asbestos Transite Ducts can be laid directly in trench without concrete envelope or other mechanical protection.

JOHNS-MANVILLE Transite Ducts

Made of Asbestos-Cement

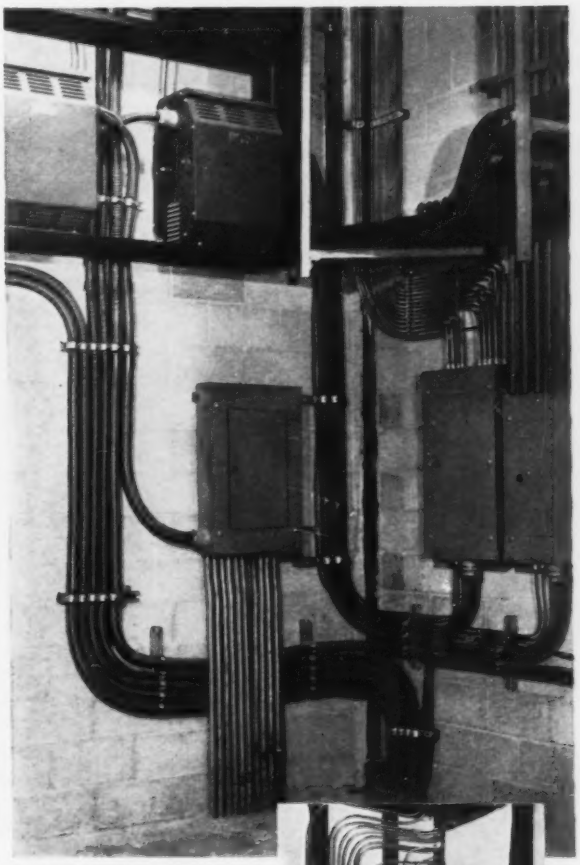
J-M Conduit for direct buried banks and exposed runs
J-M Korduct® for concrete banks

the right combination for industrial power needs!

Only General Cable manufactures both...

TYPE M.I. CABLE

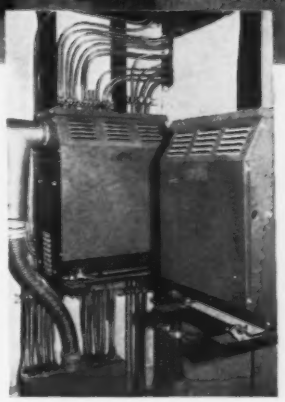
for distribution, control and lighting circuits



Installation at the St. Regis Paper Company, Jacksonville, Fla. plant.

INTERLOCKING ARMORED CABLE

for primary power feeder circuits



Easy to install in all locations, both Safety MI Cable and Interlocking Armored Cable require no mechanical protection, thus lowering costs of installation and minimizing space requirements. These constructions are easy to train around equipment or structural members, assuring the absolute minimum of interference, and present a neat, functional appearance. In addition, Safety MI Cable has unequalled physical and electrical properties: it is completely resistant to moisture, aging, nearly all chemicals, and operates at continuous high temperatures. For truly modern wiring in your plant, specify Safety MI Cable and Interlocking Armored Cable. And remember; only General Cable makes them both.

GENERAL CABLE CORPORATION 420 Lexington Avenue, New York 17, N. Y.
Offices and Distributing Centers Coast-to-Coast

for quality and service... **specify GENERAL CABLE**

Holophane

Those who know Lighting Quality

Specify HOLOPHANE

Six decades of constant research and development have earned for Holophane engineers recognition as the foremost illumination authorities... Based on their long experience with prismatic control Holophane has provided the most efficient, economical lighting systems in every field—industrial, commercial and institutional... As an identification of quality, the name Holophane is impressed on each piece.

HOLOPHANE COMPANY, INC.
Lighting Authorities Since 1898
342 Madison Ave., New York 17, N.Y.
THE HOLOPHANE CO., LTD., 418 KIPLING AVE. SO., TORONTO 14, ONTARIO

A: **PARADOME*** ceiling & suspension types

B: **Nos. 6024-6025:** 2 ft. square PRISMALUME* (acrylic plastic) CONTROLENS* for troffers or panels

C: **No. 635-AL LOBAY*** reflector for 400 W. mercury vapor lamps...

D. **Nos. 6010-6011:** 4 ft. long PRISMALUME* CONTROLENS* for continuous troffers...

E: **Recessed Incandescent Luminaire;** concave CONTROLENS* for high level Lo-Brite* lighting...

F: **Nos. 641-643 HIBAY*** reflectors; protective drip shield; 400 W. and 1000 W. mercury vapor lamps...

G: **REALITE*:** PRISMALUME* CONTROLENS*

H: **No. 415 Bracket-type** outdoor luminaire

I: **Nos. 04250-04251;** outdoor substations (incandescent or mercury lamps)...

J: **No. C-824:** Incandescent surface attached corridor light...

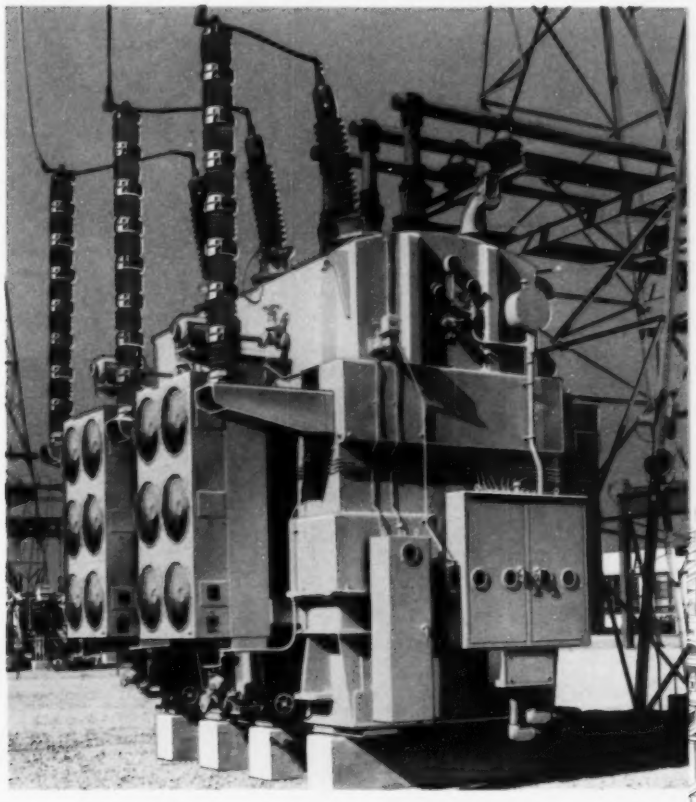
Write for Engineering Data

*®

140,000 Kva Oasis of Power!

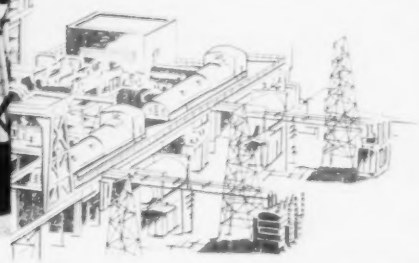
For Desert Duty at Saguaro Power Plant,

Arizona Public Service Chose PENNSYLVANIA!



ON GENERATING UNIT NO. 2

at Saguaro Steam Electric Generating Station, a Pennsylvania 140,000-kva "Contour Design" Power Transformer steps up the generated voltage of 14,700Δ volts to a transmission voltage of 115,000 volts.



The colorful desert location for Saguaro Station—30 miles north of Tucson—was selected by Arizona Public Service Company because of its proximity to highways, railroads, natural gas, and a large underground water basin. Equally important was the effective balance of the state's power generation and transmission facilities permitted by this location.

Extreme care also was taken in selecting the equipment for generating and transmitting up to 200,000 kilowatts—as much power as the entire state of Arizona used in 1942. On unit no. 2, the main step-up transformer, a 140,000-kva, 115-kv Pennsylvania Power Transformer, easily satisfies the utility's rigorous requirements regarding quality and efficiency. In addition, the compact "Contour Design" afforded considerable savings in installation time and costs—for it permitted the transformer to be shipped upright and completely assembled, except for bushings and the four oil-to-air heat exchangers.

McGRAW EDISON

For similar economy as well as proved performance, it will pay you to check Pennsylvania regarding *your* next power transformer installation. For more details or a quotation, contact Pennsylvania Transformer Division, McGraw-Edison Company, Box 330, Canonsburg, Pennsylvania.

PENNSYLVANIA TRANSFORMERS — pt

PENNSYLVANIA POWER TRANSFORMERS

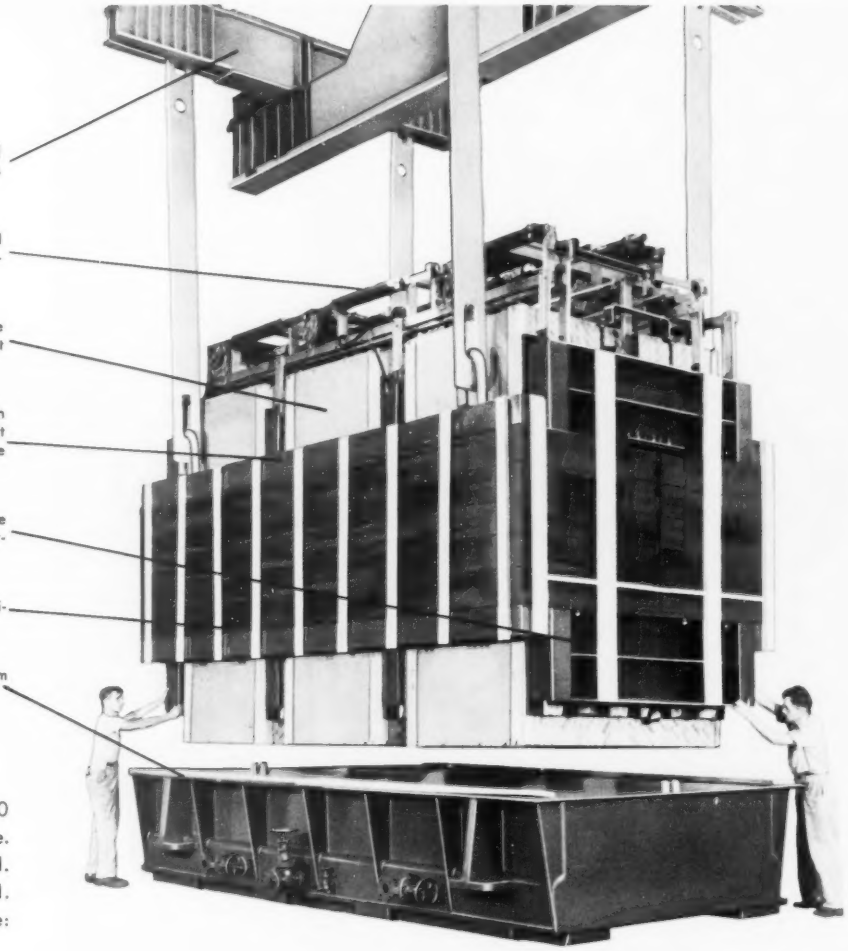
See other side for design details . . .

140,000 Kva PENNSYLVANIA

CONTOUR DESIGN POWER TRANSFORMER

IN MAIN STEP-UP SERVICE AT SAGUARO . . .

ARIZONA PUBLIC SERVICE COMPANY'S NEWEST, LARGEST POWER PLANT



Core-and-coil assembly being lowered into bottom tank section by Pennsylvania's 165-ton crane.

Tap changer located above core and coils, where it is accessible through manholes for inspection and maintenance.

Vertical cooling ducts in coils permit free flow of oil through coils for most efficient cooling.

Core and coils clamped together with heavy steel frames. Core-and-coil unit can be handled separately as complete subassembly.

Heavy box sections form part of core frame and clamp coils against short circuit forces.

Core cooled by both vertical and horizontal ducts.

Core-and-coil assembly rests on bottom section of Contour Design tank.

140,000 kva, three phase, 60 cycles, 55°C. temperature rise. Forced-oil, forced-air-cooled. High voltage: 115,000 Grd. Y/66,400 volts. Low voltage: 14,700Δ volts.

McGRAW EDISON

PENNSYLVANIA pt TRANSFORMERS

Pennsylvania has the Facilities and the Capability to meet the Largest Power Transformer Requirements

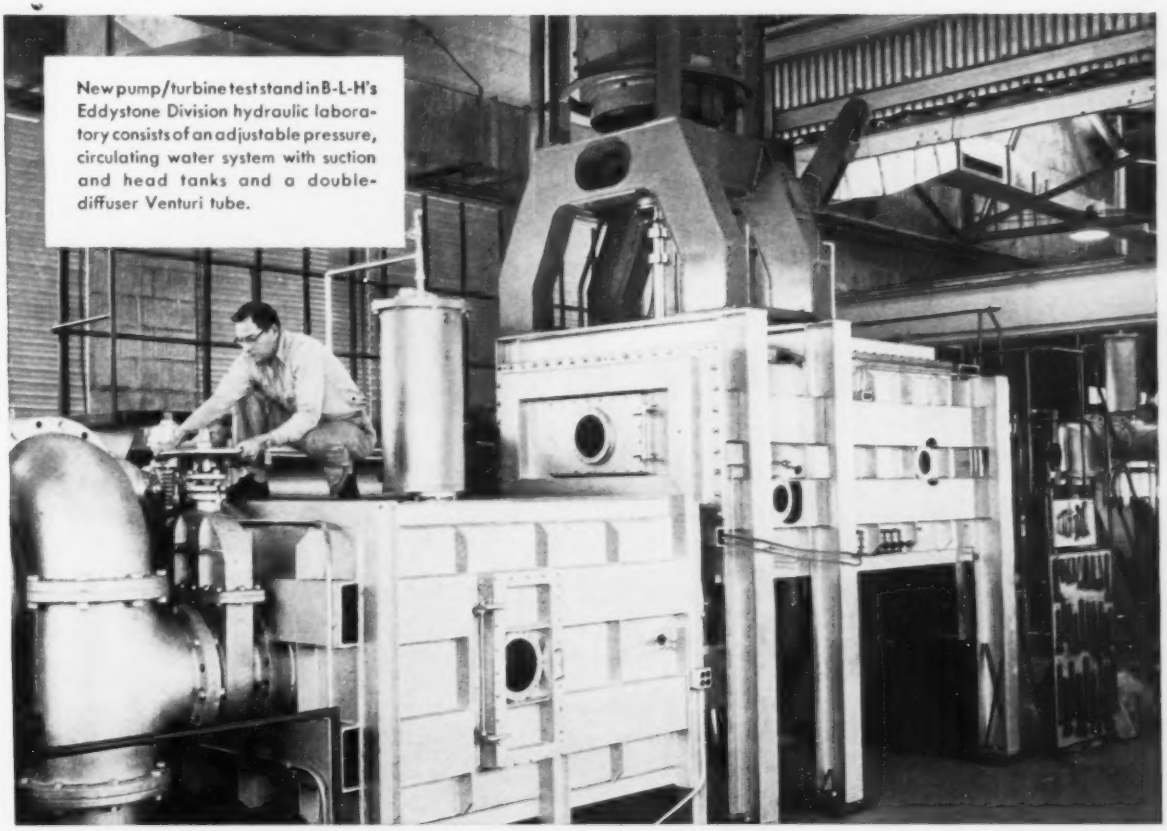
- A large, expertly-staffed engineering department with long experience in power transformer design—both core form and shell form.
- The ability to design and construct scale models for proving design characteristics.
- A modernly equipped plant capable of producing and testing the highest rated units contemplated by the industry today.
- Handling and loading facilities that permit full utilization of manufacturing, shipping and installation economies.

PENNSYLVANIA TRANSFORMER DIVISION

McGraw-Edison Company

CANONSBURG, PENNSYLVANIA Greater Pittsburgh District

See other side for installation view . . .



New pump/turbine test stand in B-L-H's Eddystone Division hydraulic laboratory consists of an adjustable pressure, circulating water system with suction and head tanks and a double-diffuser Venturi tube.

New equipment enables B-L-H to test pump/turbine models as a turbine or pump under full range of operating conditions

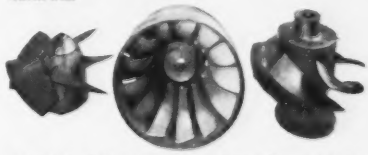
At its Eddystone Division hydraulic turbine laboratory, Baldwin-Lima-Hamilton is able to test a model both as a turbine and a pump under a complete range of operating conditions without changing the hydraulic setup. With this equipment, B-L-H is accumulating research results that will result in better designed pump/turbines and consequent narrowing of the gap between pumping energy expenditures and power generation.

The new facilities consist essentially of a circulating water tunnel with a double-diffuser Venturi tube which measures flow in either of two directions. Two butterfly valves are provided so that movement is always throttled downstream from the Venturi. A 100-hp dynamometer atop the head tank measures turbine and pump power. Water pressure is measured by manometers.

At its Eddystone Divison, B-L-H continuously conducts tests on Kaplan, Francis and fixed-blade propeller type turbines. Impulse turbine testing is carried on in the laboratories of the Pelton Division, San Francisco.

For specific information about our products and services, write to B-L-H Corporation, Philadelphia 42, Pa., or Pelton Division (B-L-H), 2929 Nineteenth Street, San Francisco 10, Calif.

Control panel for pump/turbine test stand includes dynamometer instruments and valve controls.



Models of Kaplan, Francis and fixed-blade propeller type runners used for testing purposes at the Eddystone Division hydraulic lab.

BALDWIN · LIMA · HAMILTON

Eddystone Division

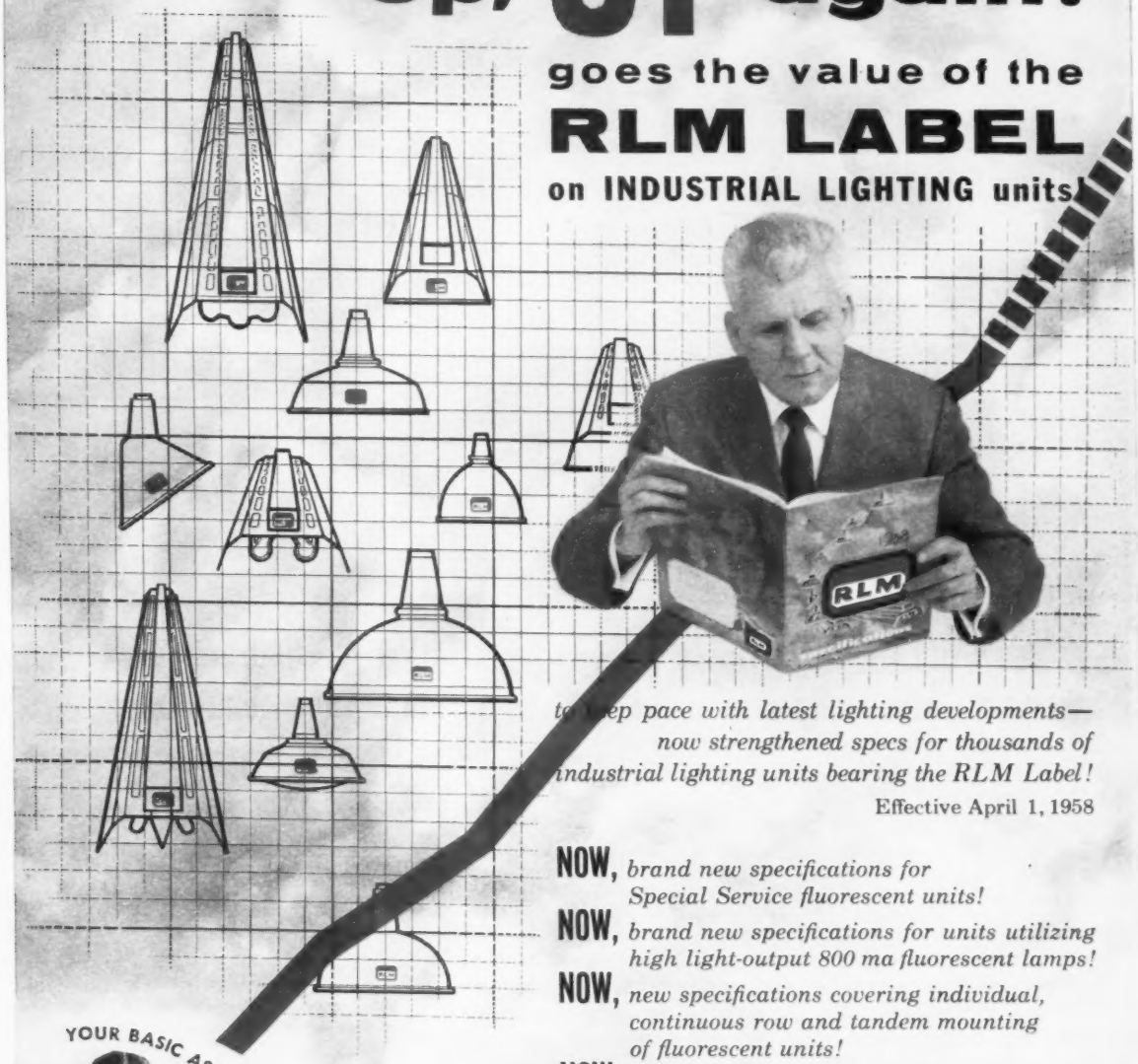
Philadelphia 42, Pa.

Hydraulic turbines • Weldments • Dump cars • Nonferrous castings • Special machinery • Bending rolls • Machine tools

BALDWIN BLH LIMA-HAMILTON

up, UP again!

goes the value of the RLM LABEL on INDUSTRIAL LIGHTING units!



to keep pace with latest lighting developments—
now strengthened specs for thousands of
industrial lighting units bearing the RLM Label!

Effective April 1, 1958

NOW, *brand new specifications for Special Service fluorescent units!*

NOW, *brand new specifications for units utilizing high light-output 800 ma fluorescent lamps!*

NOW, *new specifications covering individual, continuous row and tandem mounting of fluorescent units!*

NOW, *new additional specifications for incandescent units!*

YOUR BASIC ASSURANCE OF HIGH QUALITY

This label identifies the RLM-certified lighting equipment of 26 leading manufacturers

RLM again steps up Basic Quality Standards for the thousands of types, sizes and mounting systems of industrial lighting units covered by RLM Specifications. It means that lighting-wise and construction-wise, RLM-labeled units are today an even better Quality Buy!

RESERVE NOW YOUR FREE 1958 RLM SPECIFICATIONS BOOK!
Your complimentary copy will be sent as soon as published. In the interim mimeographed copies of the new specification changes will be sent to you with a copy of the present edition.

R-233

RLM Standards Institute, Suite 8156, 326 W. Madison St., Chicago, Illinois

New Roeclamp* with Roeplastic® Cable Costs 60% Less than Self-Supporting Cables, Minimizes Tree Problems, Installs with Ease, Looks Better!

New Roebling ROEPLASTIC Cable with ROECLAMP requires only one foot of clearance through trees! Note improved, compact appearance. No crossarms are needed.

Designed for 5kv systems (2400/4160Y and 4800 v delta) and 8kv systems (4800/8320Y and 7200 v delta), the Roebling Aerial Spaced Cable actually costs 60% less than conventional self-supporting cables. It provides a neat, compact appearance, improved voltage regulation, higher current-carrying capacity, and positive phase identification.

Up to three conductors can be carried by ROECLAMPS, which are suspended from a strong messenger. The messenger also provides protection against lightning and falling limbs.

Aluminum conductors come in 17 standard sizes and strand constructions, and are made with a greater number of finer strands for extra flexibility. Standard insulation is extruded ROEPLASTIC P-11R7 (other extruded insulations available). ROECLAMPS come complete with grommets to fit cables and messenger you order.

Ask your Roebling representative to show you the remarkable new ROECLAMP. He'll tell you more, too, about the unusual savings and improvements you can effect, or write Electrical Wire Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

Roeclamp has unit construction... installs in seconds—without tools!

One motion and ROECLAMP is on messenger and ready to receive conductors. Phase changes and repairs do not necessitate removal of clamp. ROECLAMP comes complete with grommets to fit messenger and conductors you order.

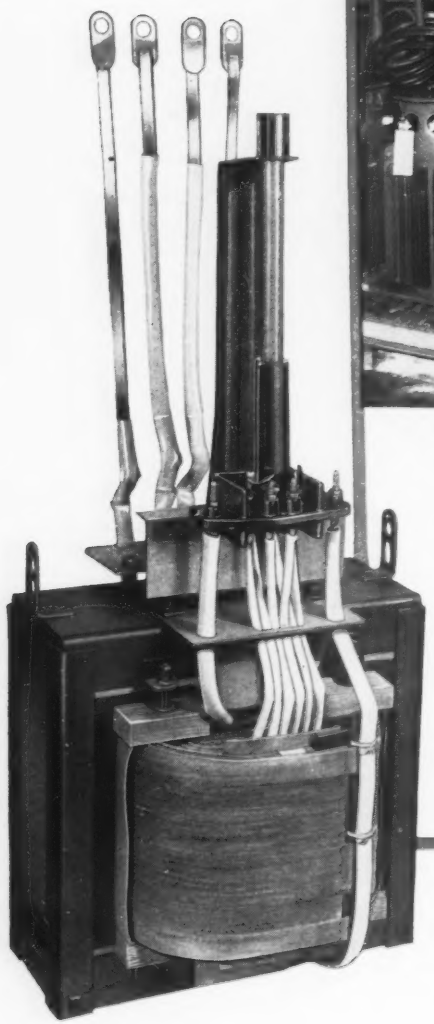
Note how easily conductors drop into place. Installation is measured in seconds, even with "boxing gloves" on. ROECLAMP is Plexiglas†, tests to over 1000-lb. breaking strength, offers outstanding weather resistance, best possible electrical properties.

35 ROECLAMPS are required every 1000 feet. Installation is completed by hand-tightening of nut. Not even a screw driver is required!

*Pat. pending
†Reg. T.M.—Rohm & Haas Co.

WAGNER FORM W TRANSFORMERS

Here is a portion of Wagner's distribution transformer plant. Wagner has been building transformers since 1893, and today's Form W Transformers bring you the benefits of the experience gained during those 65 years.

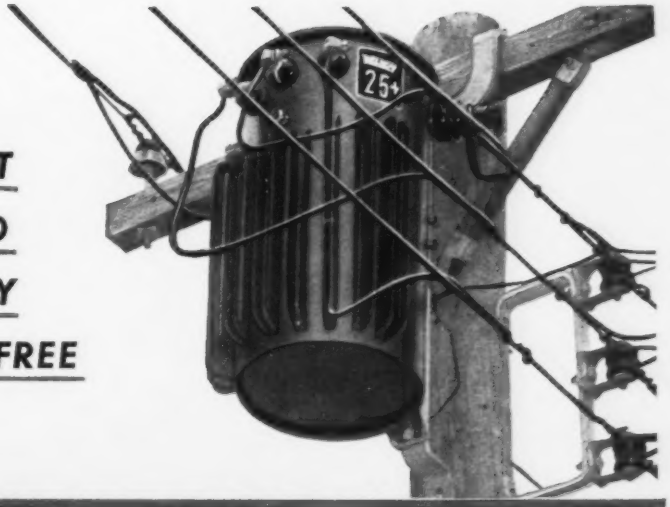


Wagner Form W Construction makes the difference

The Form W design, with oriented grain transformer steel cores, specially annealed for lowest possible magnetic losses, permits smaller and lighter elements that give excellent electrical performance with high overload capacity for peak loads. Get the full story—ask for Bulletin TU-141.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

Small in size...
light in weight... *BUT*
LIBERALLY DESIGNED
TO GIVE YOU MANY
YEARS OF TROUBLEFREE
SERVICE!



Form W Cores are cut into two turn sections and are assembled through and around the pure copper wire coils.

Form W Transformers are given all prescribed commercial tests and production line impulse tests to meet Wagner's standards for uniformly high quality.

All Wagner Form W Transformers, rated from 3 to 167 kva, 15 KV and below, are designed for pole mounting. The line includes a complete range of single-phase ratings to 500 kva, 69 KV and below.

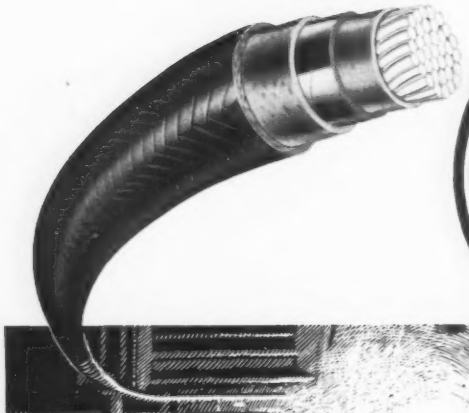
WTSB-13

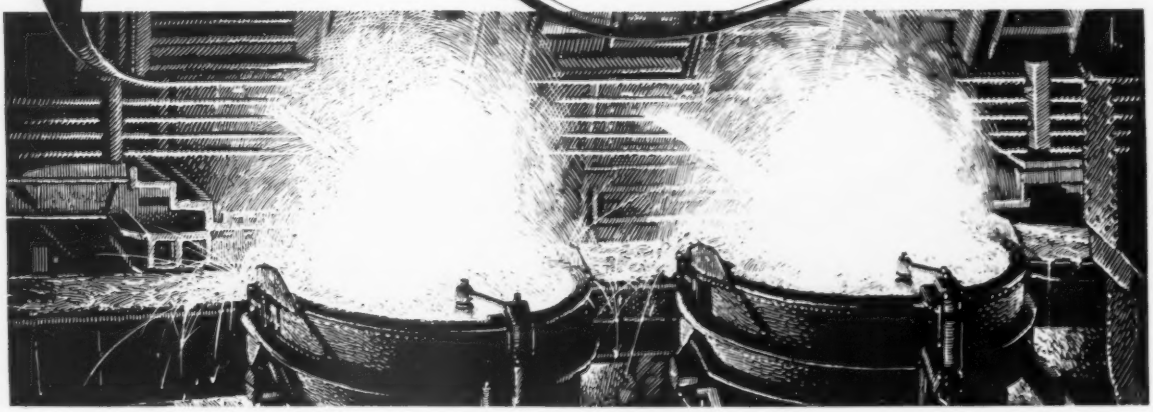
Wagner Electric Corporation

6381 PLYMOUTH AVENUE, ST. LOUIS 14, MISSOURI

WHEN HEAT'S A PROBLEM . . .

SPECIFY and BUY
ROCKBESTOS
A.V.C.





Steel Mill and Foundry "hot spots" provide one of industry's worst torture chambers for wire and cable. Heat, overloads and corrosive fumes combine to kill ordinary cable quickly.

Don't take a chance on ordinary cable for troublesome "hot spot" applications. *Specify and use Rockbestos A.V.C.*

This superior AVA cable, with asbestos, varnished cambric insulation, takes temperatures up to 230°F, assuring continuous operation in hot spot applications, provides greater current carrying capacity for increased and new loads.

When you *specify and buy Rockbestos* **A.V.C.**, you reduce your electrical maintenance and construction costs . . . you get years more dependable service.

Write now for the new Rockbestos RSS-88 to help you *specify and buy Rockbestos* **A.V.C.**

ROCKBESTOS PRODUCTS CORPORATION
NEW HAVEN 4, CONNECTICUT

NEW YORK • CLEVELAND • DETROIT • CHICAGO • OAKLAND
PITTSBURGH • ST. LOUIS • LOS ANGELES • SEATTLE • ATLANTA • DALLAS

ROCKBESTOS A.V.C.

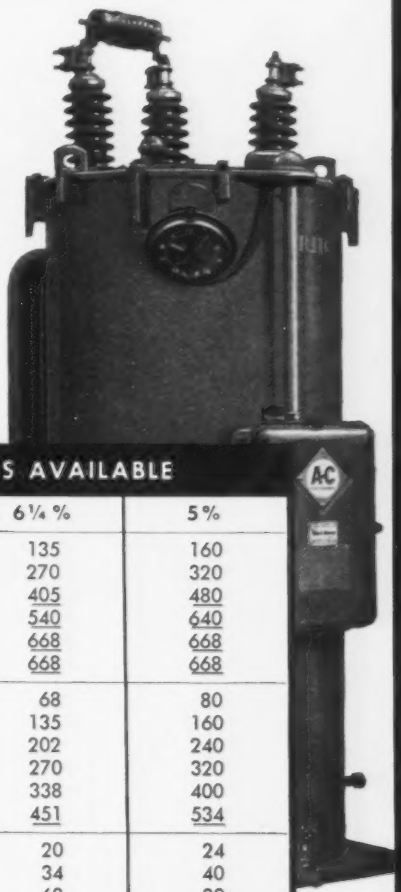
THE SUPERIOR A.V.A. CABLE

Allis-Chalmers—25 Years of Leadership in 5/8% Regulators

now... *Vari-Amp Ratings*

to 668 Amperes on Allis-Chalmers

distribution voltage regulators



RATING		RANGE AND CURRENT RATINGS AVAILABLE				
VOLTS	KVA	10%	8¾%	7½%	6¼%	5%
2,500	25.0	100	110	120	135	160
	50.0	200	220	240	270	320
	75.0	300	330	360	405	480
	100	400	440	480	540	640
	125	500	550	600	668	668
	167	668	668	668	668	668
5,000	25.0	50	55	60	68	80
	50.0	100	110	120	135	160
	75.0	150	165	180	202	240
	100	200	220	240	270	320
	125	250	275	300	338	400
	167	334	367	401	451	534
7,620	11.4	15	17	18	20	24
	19	25	28	30	34	40
	38.1	50	55	60	68	80
	57.2	75	83	90	102	120
	76.2	100	110	120	135	160
	114.3	150	165	180	203	240
	167	219/241	241/265	263/289	296/326	351/386
	250	328/361	361/397	394/434	443/487	525/578
13,800	34.5	25	28	30	34	40
	69.0	50	55	60	68	80
	138.0	100	110	120	135	160
14,400	36.0	25	28	30	34	40
	72.0	50	55	60	68	80
	144.0	100	110	120	135	160

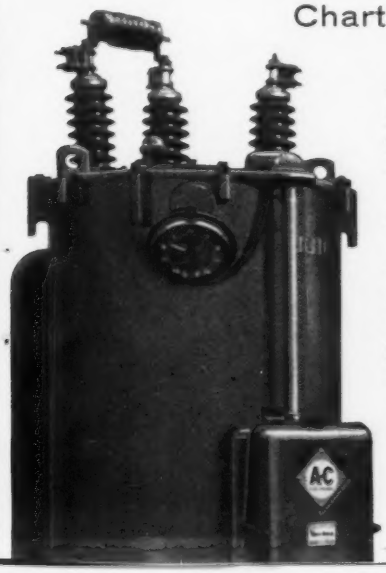


Chart shows ratings to 668 amperes with 21 new *Vari-Amp* ratings

Vari-Amp can now be used to increase regulator capacity (while decreasing range of regulation) to a maximum allowable current of 668 amperes or 160%. This new development results in increased applications for distribution regulators and further lowers the cost of regulation.

You now get as much as 50% increased kva capacity on 21 different ratings of Allis-Chalmers ⅝% step regulators.

These new load-carrying capabilities have been tested in actual field service for four years and many of the new ratings are in stock for immediate shipment. Behind this announcement is the continuous development program that has maintained Allis-Chalmers design and operational leadership during the past 25 years.

For details, contact your nearby A-C office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

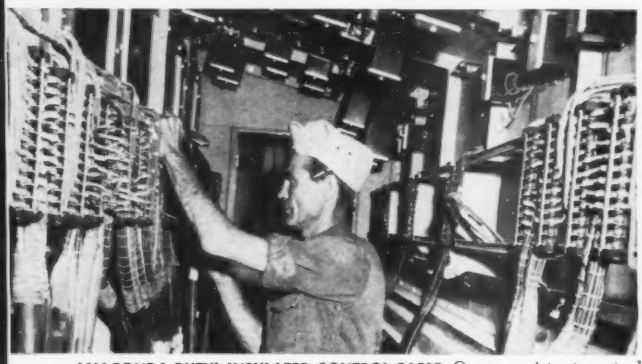
ALLIS-CHALMERS

A-5751

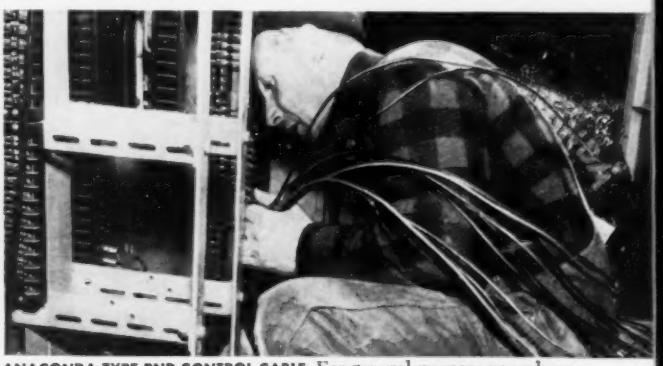
Match the conditions in your plant with these Anaconda Control Cables

ANACONDA TYPE ANW-RUBBER-INSULATED CONTROL CABLE. Peak reliability, outstanding heat resistance. Cable is also highly resistant to moisture, acids, alkalies, other chemicals. Unusual overload capacity and long-aging characteristics. Individual conductor covering and over-all jacket of neoprene.

ANACONDA THERMOPLASTIC CONTROL CABLE. Multiple-use: aerially, in conduit, underground in ducts, direct burial in earth. Available with polyethylene (600 or 1000 volts) or Densheath* vinyl resin (600 volts) insulation and Densheath over-all jacket. Densheath jackets over polyethylene-insulated conductors on request.



ANACONDA BUTYL-INSULATED CONTROL CABLE. Ozone-resistant control cable. Individual conductor covering and over-all jacket of neoprene provide maximum insurance against moisture, mechanical injury. High-quality product with outstanding performance record.



ANACONDA TYPE PND CONTROL CABLE. For general-purpose use where space is limited. Allows installation of a 12-conductor cable in conduit carrying a 6 or 7. Individual conductor covering of abrasion-, oil-, gasoline-resistant nylon. Over-all Densheath jacket.

APPLICATION CHART FOR ANACONDA CONTROL CABLE

TYPE AND VOLTAGE RATING	CHARACTERISTICS	GENERAL APPLICATIONS	INSTALLATION METHODS
RUBBER—Insulated Control Cables			
Rubber-Insulated 600-Volts	Excellent moisture, heat resistance. Long-aging.	General-purpose and station control requirements.	Installed aerially, in conduit, underground in ducts—or buried directly in earth.
Ozone-Resistant Rubber—Insulated 600-Volts	Ozone-resistant. Proved moisture resistance, heat stability Long-aging.		
THERMOPLASTIC—Insulated Control Cables			
Polyethylene-Insulated 600-Volts	Excellent moisture and chemical resistance. Highly resistant to electroendosmosis. Long-lived.	General-purpose control requirements.	Installed aerially, in conduit, underground in ducts—or buried directly in earth.
DENSHEATH*-Insulated 600-Volts	Thermoplastic cable. Excellent moisture and chemical resistance. Long-aging.		
Anaconda Type PND* Polyethylene-Insulated-Nylon Conductor Cover 600-Volts**	Dependable chemical and abrasion resistance. Small diameter. Long-aging.	General-purpose control requirements where space is a limiting factor.	Installed aerially, in conduit or underground in ducts.
Polyethylene-Insulated 1000-Volts	Peak moisture and chemical resistance. Heavy insulation thickness. Long-aging.	Station control requirements.	Installed aerially, in conduit, underground in ducts—or buried directly in earth.

** IPCEA voltage rating is 300 volts. *Trademark. Lead sheaths furnished on rubber-insulated control cables if requested. Interlocked armor available for all types of control cable.

For full facts on any of Anaconda's complete line of control cables – including cables engineered for more specialized control requirements – see your Anaconda distributor or the Man from Anaconda. A comprehensive technical booklet on Anaconda Control Cables is yours for the asking. Write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N.Y.

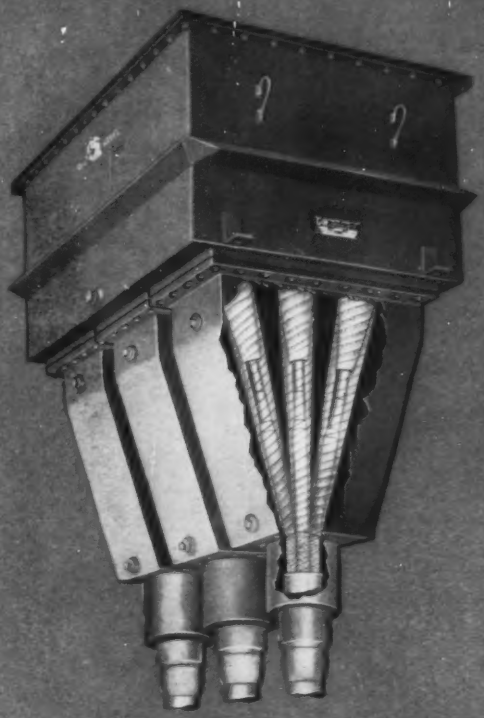
FASTEST WESTERN SERVICE – At Orange, California, Anaconda's expanded, modernized mill fabricates and stocks copper and aluminum wire and cable for *every type of application*. Anaconda assures the fastest possible service on all West Coast needs. See Anaconda Sales Offices: Los Angeles, San Francisco, Seattle, Denver. 5834G

SEE THE MAN FROM **ANACONDA®**
FOR **CONTROL CABLE**

LIVE BETTER ELECTRICALLY

*Reg. U.S. Pat. Off.

INVESTIGATE THESE REASONS FOR USING OIL FILLED LINK BOXES



FOR CABLES OF ANY SIZE OR VOLTAGE

- Permits sectionalization of circuits (under no-voltage conditions), allowing isolation or grounding of one or more cables
- Point of access for phasing or fault location
- Provides low cost distribution
- Serves as an isolating barrier between cables having different types of insulation
- Serves as a stop joint to reduce internal cable pressures caused by varying elevations of cable routing
- Specialized skill generally required for making wye joints is reduced to normal skill needed for straight joints or pothead installations

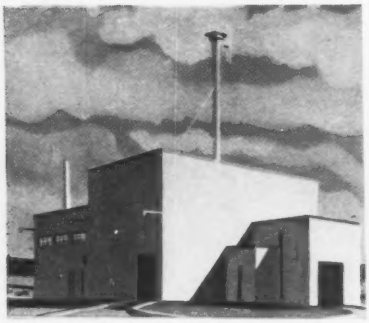
Conduct your investigation through a G&W representative. He will be glad to assist you.

Illustrated above: Oil filled box with gas filled cableheads and stud bushings—3 way, 3 pole, 34.5 kv, 500 mcm, LPGF cables. (Available also with hermetically sealed potheads—either may be filled with compound, oil or gas.)

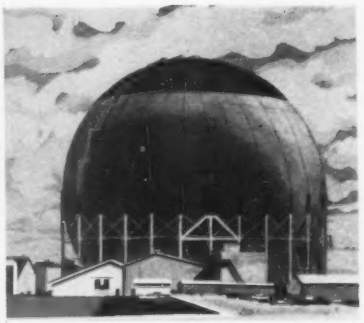
G&W ELECTRIC SPECIALTY COMPANY
3500 WEST 127TH STREET • BLUE ISLAND, ILLINOIS
CANADIAN MFR. — POWERLITE DEVICES LTD. — TORONTO MONTREAL & VANCOUVER

B581

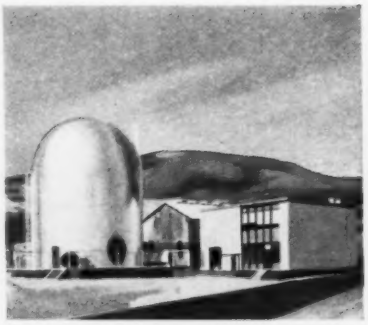
4 Firsts in Nuclear Power



FIRST nuclear electric power generation: Experimental Breeder Reactor I, National Reactor Testing Station, Idaho. Constructed, 1951, for Atomic Energy Commission.



FIRST nuclear electric power for commercial use: Knolls Atomic Power Laboratory, West Milton, N. Y., operated by General Electric Company for the AEC. Nuclear reactor by G-E—power plant engineered and constructed by Bechtel, 1955.

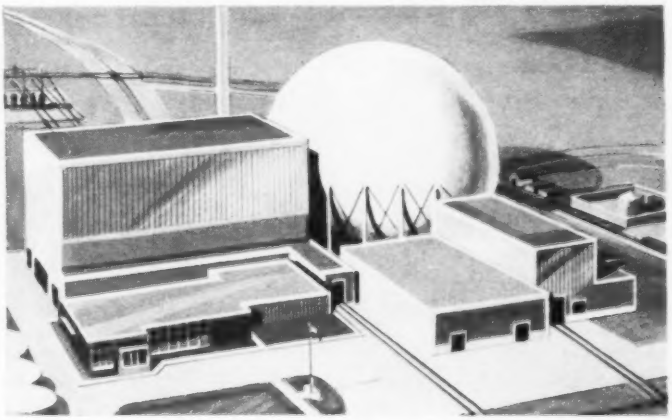


FIRST all-privately financed nuclear power plant: Developmental boiling water reactor at General Electric's Vallecitos Atomic Laboratory, Pleasanton, California, furnishes steam for electric generating facilities of the Pacific Gas & Electric Company. Engineered and constructed in 1957 for G-E and P G & E.

BECHTEL
Corporation

Engineers and Builders for Industry

In each of four projects recognized as important "firsts" in the development of nuclear power for peacetime uses, Bechtel has had an active and substantial part.

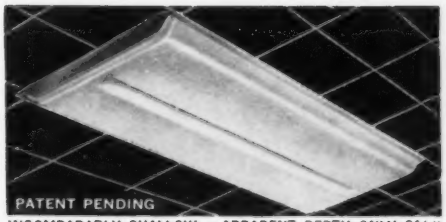


FIRST major—and America's largest—privately financed all-nuclear power plant: the 180 megawatt Dresden Nuclear Power Station of Commonwealth Edison Company, Chicago, and the Nuclear Power Group, Inc. Bechtel, a member of the Nuclear Power Group, is engineer-constructor for General Electric, the prime contractor. Now under construction.

SAN FRANCISCO — Los Angeles — New York — Houston • CANADIAN BECHTEL LIMITED: Toronto — Vancouver

SHALLORAMA®

the NATURAL choice in re-lighting



INCOMPARABLY SHALLOW • APPARENT DEPTH ONLY 2¼"

Designed for architects, interior decorators and building owners, the custom-styled SHALLORAMA® is a *natural* when it comes to re-lighting.

Here is a fixture combining clean, contemporary styling with basic simplicity and minimum maintenance. Easy to mount over existing outlets, these surface-mounted Visionaires® are so shallow in appearance they almost look recessed.

Available in 2 and 4 lamp widths, SHALLORAMA® is extremely versatile and suited for applications in offices, stores, banks, schools...especially in low ceiling installations. Re-light with Plexiglas shielded SHALLORAMA® for long-term serviceability.

SUNBEAM LIGHTING COMPANY
777 EAST 14TH PL., LOS ANGELES 21, CALIF.

SUNBEAM visionaire

wrap up splicing problems for keeps

Field experience proves performance advantages of Preformed splices

In hundreds of thousands of applications, only one failure of a Preformed splice has been reported—and that was caused by inadequate preparation of a heavily corroded conductor.

This distinctive performance is the result of soundly engineered features: (1) uniform radial pressure of the splice rods; (2) full area of contact; (3) the flexibility of the rods which causes the grit particles to penetrate existing oxides and establish permanent electrical contact with the conductor; and (4) the inherent resiliency of the splice which maintains consistent surface contact with the conductor throughout extremes of line tension and temperature variation. These combined characteristics are your assurance of unfaltering mechanical and electrical performance at all times.

And, most important, no tools are needed to install a Preformed splice; the application is made entirely by hand and takes but a fraction of the time required for other types of splices.

There are Preformed splices to solve almost every splicing problem. They can be furnished to hold the full-rated strength of any standard transmission or distribution conductor.

Write for additional technical information. PREFORMED LINE PRODUCTS COMPANY, 5349 St. Clair Avenue, Cleveland 3, Ohio. Cable Address: Preformed-Cleveland . . . manufacturer of armor rods, dead-ends, Guy-Grip dead-ends and other line accessories.

PLP

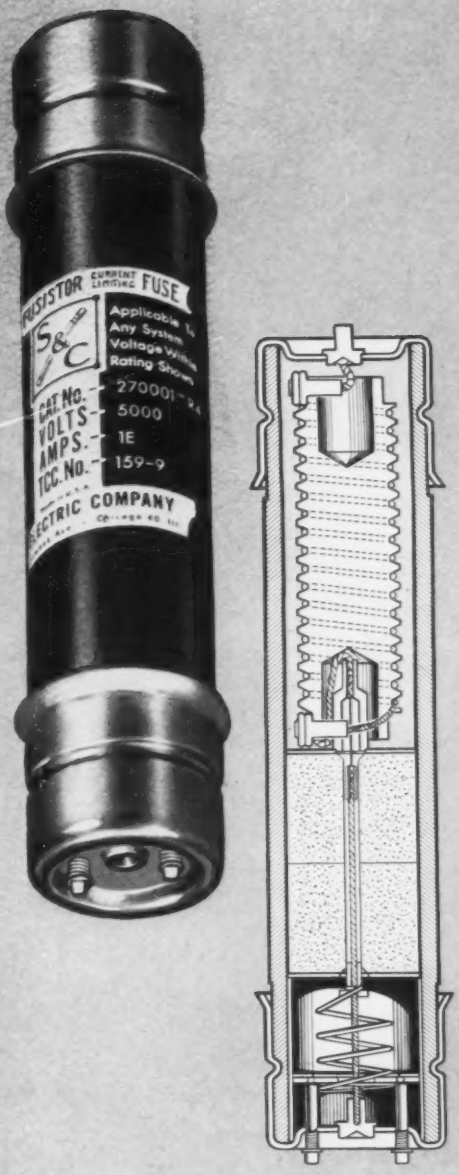
10 YEARS OF Power Line Progress

You can look up to **Preformed**

Made in accordance with or for use under U.S. Patent Nos. 2,609,653; 2,275,019; 2,587,521; and 2,691,685. Other patents pending.

for potential transformers...

S&C's new Fusistor, a universal current limiting fuse



UNIVERSAL because it is not critical as to system voltage. For example, the 14.4 kv Fusistor will take care of all system voltages down to 2.4 kv without impairment of its interrupting ability, and without inducing excessive transient overvoltages during interruption. Contrast this with other current limiting fuses which must be applied between 70% and 100% of nameplate voltage rating.

UNIVERSAL because it fits all mountings, regardless of make. And just two ratings (different clip centers) will take care of most indoor potential transformer protection needs at 14.4 kv and below. There's no need to stock a rating for each system voltage.

HERE'S WHY: The Fusistor interrupts faults even at voltages substantially below its rating because of the inherent operating characteristics of its current limiting section (upper half of cutaway drawing, right). It uses helically coiled molybdenum wire, in turn helically coiled on a ceramic core, embedded in silica sand. Molybdenum has a high resistance even under normal conditions, and when fault current flows, its resistance increases rapidly. Thus, the Fusistor responds immediately to the fault, and—because of molybdenum's high melting temperature—its current limiting action continues longer. And when the molybdenum does melt, there is a less pronounced "chopping" of the current.

In the lower half of the Fusistor is a separate circuit interrupting section. Using time-tested boric acid, it *positively* interrupts even the lowest faults. And on maximum faults, both sections combine to limit and interrupt the current. The Fusistor thus gives positive protection over the full range of fault currents.

Fusistors rated 4.8 kv and higher have two plunger indicators (shown at the bottom of both views) which drop down to show that the fuse has blown.

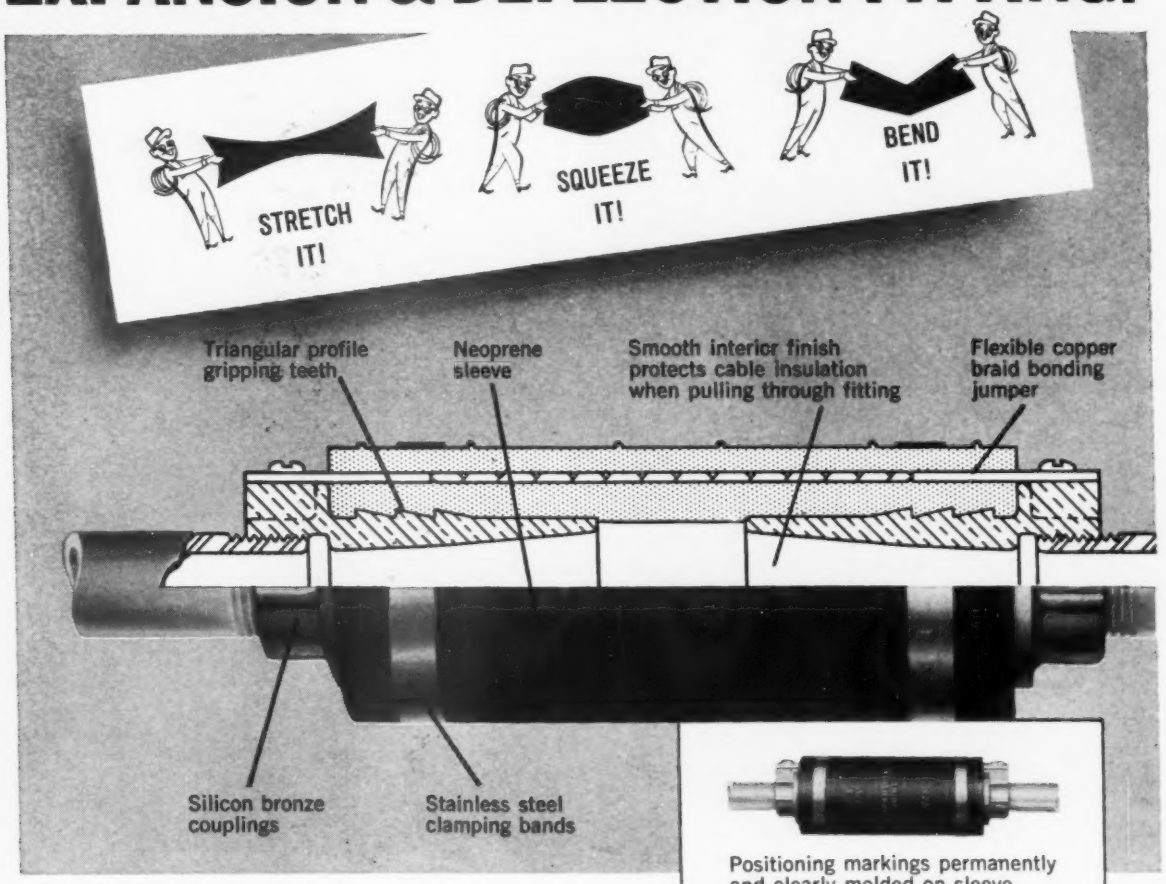
S&C Electric Company, 4425 Ravenswood Ave., Chicago 40, Ill. In Canada: S&C Electric Canada, Ltd., 8 Vansco Rd., Toronto 14, Ont.

Power Fuses
Distribution:—
Disconnects
Cutouts
Fuse Links
Loadbuster
Load Interrupters
Metalclad Switchgear

S&C ELECTRIC COMPANY

For Positive Freedom of Conduit Movement—

THE ALL NEW O.Z. TYPE "DX" EXPANSION & DEFLECTION FITTING!*



Here's the newest addition to a long line of O.Z. expansion and deflection fittings — the O.Z. Type "DX"! Of completely new design and construction, it provides fitting features *never found before!*

The all-new Type "DX" is designed principally to compensate for expansion, contraction, and deflection in conduit across expansion joints in concrete, but it also may be used as a vibration damper.

For more information on this rugged, corrosion-proof, Weathertight fitting, call your local O.Z. distributor or write direct to the company.

Positioning markings permanently and clearly molded on sleeve assure proper placement of fitting in expansion joint

- **Compensates for expansion, contraction, deflection; may be used as a vibration damper.**
- **¾" expansion and contraction movement.**
- **30° angular deflection from the normal in any direction.**
- **Corrosion-proof!**
- **Weathertight!**

*Patent Pending

O.Z. ELECTRICAL MANUFACTURING CO., INC.

262 BOND STREET • BROOKLYN 17, N. Y.

- CAST IRON BOXES
- CABLE TERMINATORS
- POWER CONNECTORS
- SOLDERLESS CONNECTORS
- GROUNDING DEVICES
- CONDUIT FITTINGS
- INTERLOCKED ARMOR CABLE FITTINGS

Sales Office and Warehouse: 406 So. Cicero Avenue, Chicago 44, Ill. • ESterbrook 9-0326
Office and Factory: 749 Bryant Street, San Francisco 7, Calif. • GArfield 1-7846

keep an eye on
SYSTEM VOLTAGE

SANGAMO LINCOLN THERMAL VOLTMETERS

are the key to economical system planning

Utility engineers need reliable information on system voltage to solve present distribution problems—maintain specific voltage levels—anticipate tomorrow's voltage requirements.

Sangamo Lincoln Thermal Voltmeters are the lowest cost means of obtaining accurate, continuous knowledge of the voltage spread at check points throughout your system.

Permanent Installations of Sangamo Lincoln Thermal Voltmeters give you these benefits:

- *Continuous record of voltage conditions*
- *Indication of only "steady state" voltage variations for ease in setting voltage regulators*
- *Economical socket installation*
- *Simple reading—quick resetting*
- *Reduction of expensive service calls*
- *Elimination of costly periodic surveys*

Ask your Sangamo Representative, or write us for full information on Sangamo Lincoln Thermal Voltmeters and other Sangamo equipment for system betterment.

BILL OF MATERIAL

1—V2S* Thermal Voltmeter. $30.74

1—Standard Meter Socket . . . 2.92

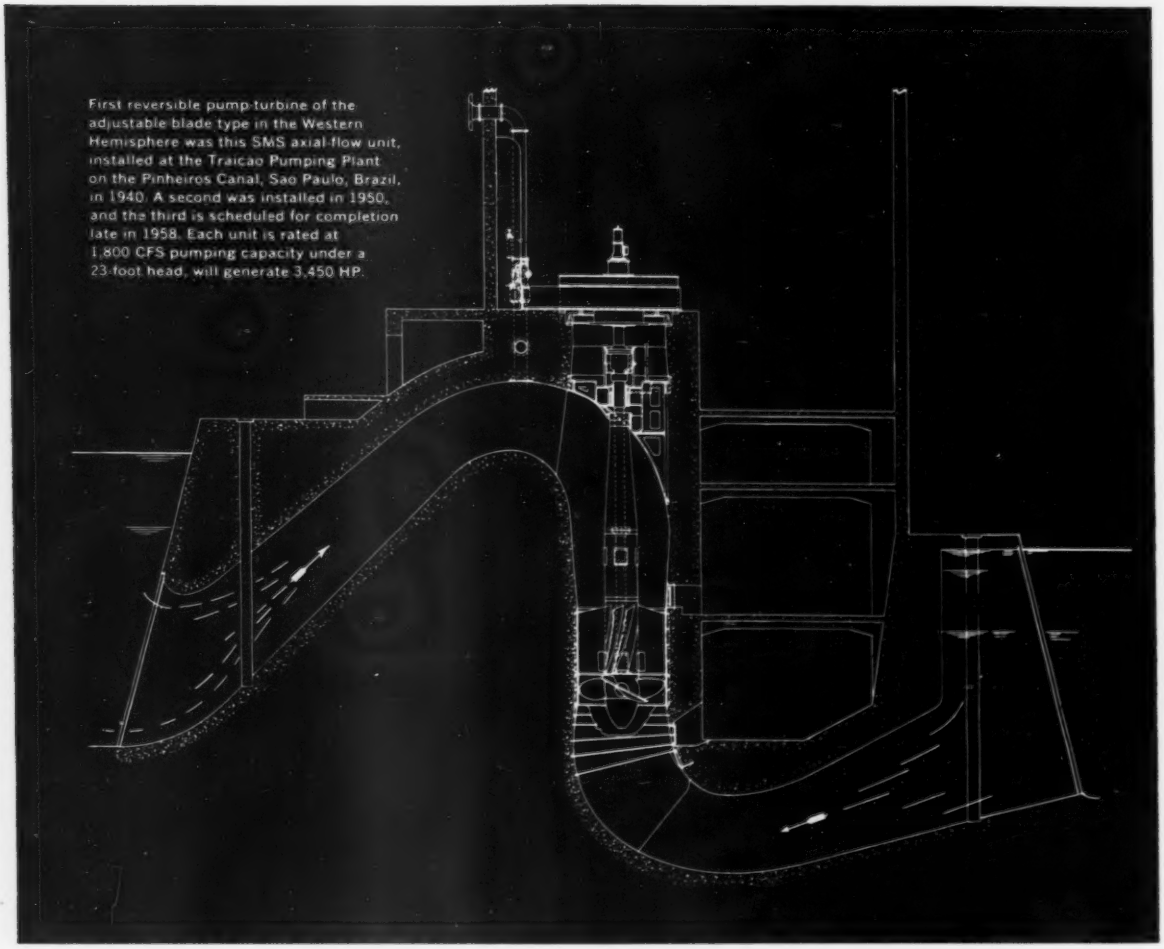
*Used where outages are not a problem.

1—V3S† Thermal Voltmeter. $42.34

†Minimum reading not affected by outages.

SM58-A

SANGAMO ELECTRIC COMPANY Springfield, Ill.


First reversible pump-turbine of the adjustable blade type in the Western Hemisphere was this SMS axial-flow unit, installed at the Traicao Pumping Plant on the Pinheiros Canal, Sao Paulo, Brazil, in 1940. A second was installed in 1950, and the third is scheduled for completion late in 1958. Each unit is rated at 1,800 CFS pumping capacity under a 23-foot head, will generate 3,450 HP.

THIRD SMS PUMP-TURBINE UNIT ORDERED FOR TRAICAO PUMPING PLANT

These SMS adjustable-blade, axial-flow, pump-turbines at Traicao are the first reversible pump-turbines designed and manufactured in this hemisphere, and probably the only axial-flow units of this type in the world. SMS also manufactures other types. At the Pedreira Plant in Brazil, for instance, a more conventional centrifugal pump-turbine was installed in 1947. This SMS unit, operating under a 91.8-foot head, pumps 1,497 CFS at 138.5 RPM, and is rated at 16,000 HP when generating.

Recently, the Power Authority of the State of New York has placed an order with S. Morgan Smith for the manufacture of six pump-turbines for the Tuscarora Plant at Niagara Falls, New York. Each of these units is rated at 28,000 HP when generating, and at 3,400 CFS when pumping.

In addition to single-reversible, dual-purpose units like those at Traicao, Pedreira, and Tuscarora, SMS helped pioneer pumped-storage. The first large-scale application of separate pumps and turbines in the U. S. was for Connecticut Light & Power Company's Rocky River Plant, built in 1926. Here an SMS-Francis turbine, rated at 36,100 HP under a 226-foot head, was installed.

These installations are part of a broad background of experience in the engineering, designing and manufacturing of pump-turbines that is available to you at SMS. For information, write to S. Morgan Smith Company, York, Pennsylvania.

More Power To . . . LIVE BETTER THE ELECTRICAL WAY

S. MORGAN SMITH

HYDRODYNAMICS

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

Rotovalves • Ball Valves • R-S Butterfly Valves • Free-Discharge Valves • Liquid Heaters • Pumps • Hydraulic Turbines & Accessories

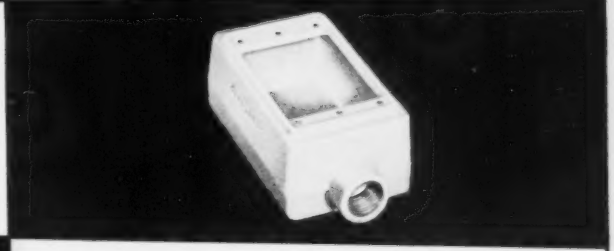
Cut costs... without cutting corners! Specify... GEDNEY CONDUIT BODIES

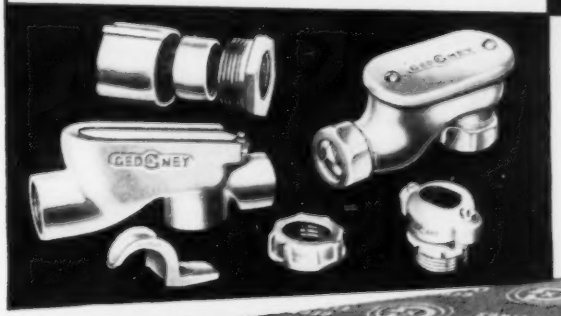
Gedney Conduit Bodies mean lowest installed cost! That's because they are skillfully made of tough, *malleable* iron, then hot-dip galvanized, and finally, they must pass the toughest inspection. Accurate machining and threading assure easiest installation . . . ruggedness assures longest service life!

THE GEDNEY CONDUIT BODY LINE INCLUDES ALL TYPES—SIZES ½" TO 4"

TYPE LB—Threaded—for heavy-wall rigid conduit. Use them with Gedney entrance fittings, straps, clamp backs to get an *entire* conduit system that is hot-dip galvanized.

TYPE FS—Threaded—shallow bodies for heavy-wall rigid conduit. Hot-dip galvanized finish prevents corrosive deposits—means easier installation, longer life.





SCORES OF OTHER GEDNEY FITTINGS are available for every purpose—all carefully designed, manufactured and inspected to assure economical installation and maximum customer satisfaction.

GEDNEY FITTINGS FIT

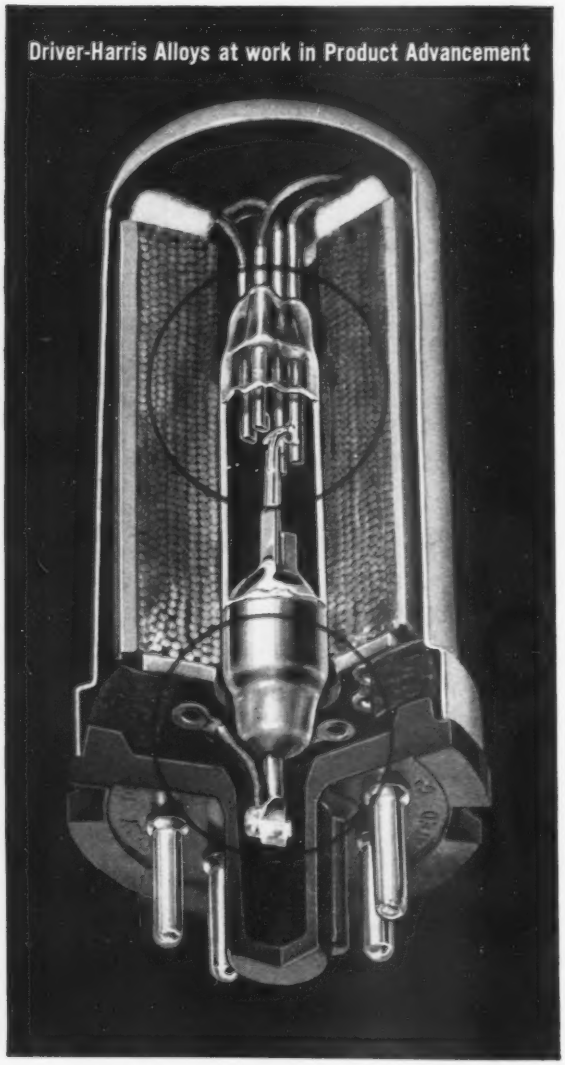
GEDNEY
ELECTRIC COMPANY

GEDNEY

RKO BLDG., RADIO CITY, NEW YORK 20
Foundry, Factory and Shipping Point: Terryville, Conn.

Improved Metal-To-Glass Alloy Holds Seals Tight Against Hydrogen at 250 Pounds Pressure

Development of Clare† Mercury-Wetted Contact Relays aided by special gas-free Driver-Harris #152 Alloy



For all kinds of high-speed switching machines and devices which demand accuracy and dependability of the highest order, this new Clare Type HG Relay offers a combination of high speed, high current-and-voltage capacity with remarkably uniform long-life performance. It has a conservative life expectancy of more than a *billion operations* when operated within its ratings and can be driven at speeds up to *100 operations per second*.

In this cutaway view (2¾ x) a magnetic switch, hermetically sealed in a high-pressure hydrogen filled glass capsule, and a coil, are enclosed in a steel vacuum tube type envelope. The switch forms the core of the coil which provides the magnetomotive force for operating it.

The glass enclosed switch is very compact and small (5/16" diameter x 2" long) yet its handling capacities of 5 amperes and 500 volts maximum are truly remarkable.

These features of its construction make this possible. In the switch segment, the platinum contact surfaces are wetted and protected from electrical and mechanical erosion with mercury by means of a capillary connection to a mercury reservoir below the contacts. In addition, the high hydrogen pressure enables the contact gap to withstand a high voltage gradient without breakdown.

Keeping the gas from leaking posed a production problem. The specifications for the lead wires at the top of the switch and the tubular vacuum stem at the bottom were stiff. 1. Gas-tight seal against hydrogen at 250 PSI. This was difficult. 2. Perfect match to thermal expansion characteristics of the glass. 3. Good ferromagnetic properties. 4. Exceptional surface bonding properties since the permissible maximum 5 ampere 500 volt limits are dictated rather by factors relating to heating of the metal-to-glass seal than the current handling capacities of the contacts.

Driver-Harris was called upon to produce such an alloy and succeeded in developing a special gas-free nickel-iron alloy No. 152 which meets all these requirements to the complete satisfaction of Clare Engineers.

Do your engineering and product development plans hinge upon a special alloy — why not discuss it with Driver-Harris. We have, since 1899, produced 132 special purpose alloys in just this fashion — in answer to a particular problem and extraordinary specifications. We have a special bulletin on Sealing Alloys if you care to have one. Your inquiry is awaited.

†C. P. Clare & Co., Chicago, Ill.
*T.M. Reg. U.S. Pat. Off.

DRIVER-HARRIS* COMPANY

HARRISON, NEW JERSEY

Distributor: ANGUS CAMPBELL, INC. • 4417 South Soto Street, Los Angeles 58 • 760 Tennessee Street, San Francisco 7

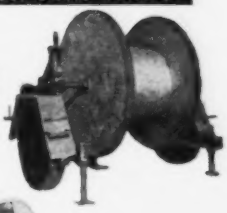
MAKERS OF THE MOST COMPLETE LINE OF ALLOYS FOR THE ELECTRICAL, ELECTRONIC, AND HEAT-TREATING INDUSTRIES

PENGO Job-Proved Tension-Stringing Equipment

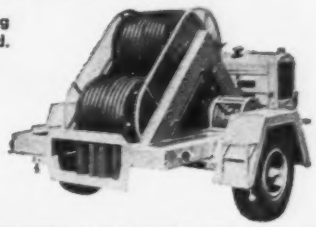
Manufactured by the makers of the World Famous PENGO Earth Auger

NOTE: More than 40 models of PENGO Tension-Stringing equipment models are available for every stringing need.

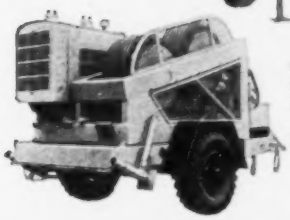
PENGO Bullwheel Cable Pullers



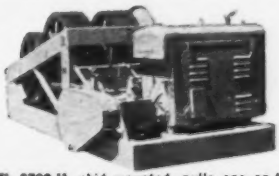
MODEL 6100 TC-RW Reel Winder.



MODEL 5700-II, trailer mounted, pulls one or two conductors or pulling lines. Tensions to 4,000 lbs. Use with PENGO 6100 TC-RW Reel Winder.

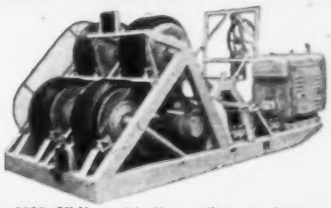


MODEL 6700-I, trailer mounted, pulls one conductor or pulling line. Tensions to 12,000 lbs. Use with PENGO 6100 TC-RW Reel Winder.

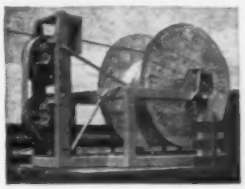


MODEL 6700-II, skid mounted, pulls one or two conductors or pulling lines. Tensions to 12,000 lbs. Use with the 6100 TC-RW Reel Winder.

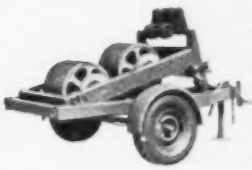
PENGO Tensioners



MODEL 6000 SK-II combination puller and tensioner. Handles one or two conductors to 1,272,000 CM.

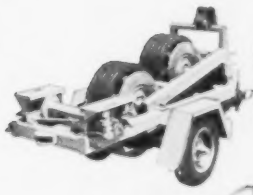


MODEL 5000 S-I strings one conductor to 556,000 CM. Tensions to 2000 lbs., takes reels to 44" x 72".



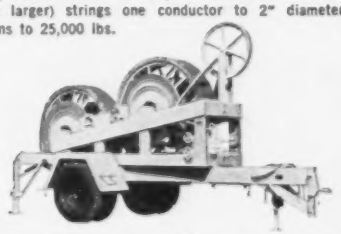
MODEL 5000 TR-II strings one or two conductors to 556,300 CM. Tensions to 1500 lbs. per conductor. Designed for very rough country work as well as general use; use with separate reel-carrying dolly or PENGO 6100 CT-RW.

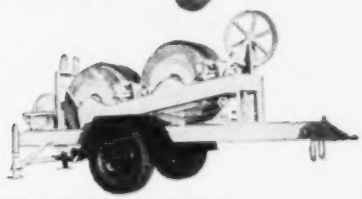
MODEL 6000 WS-TR strings one or two conductors to 1,272,000 CM. Tensions to 5000 lbs. per conductor. Complete trailer unit with reel-carrying devices, for general and medium-rough country use.



MODEL 6000 XHD-TR-I shown with snubbing brake. Strings one conductor to 1,272,000 CM. Tensions to 10,000 lbs.

(Below) **MODEL 7000 TR-I-72** (similar to 6000 XHD-TR-I, except larger) strings one conductor to 2" diameter. Tensions to 25,000 lbs.





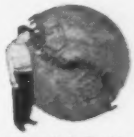
MODEL 7000 TR-I-54 strings one conductor to 2" diameter. Tensions to 25,000 lbs. Extra sturdy, with 54" Bullwheels for low center of gravity — ideal for mountainous terrain.

List your requirements and send for descriptive literature and prices.

PETERSEN ENGINEERING CO., INC.

Santa Clara, California

Other PENGO Products

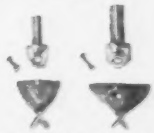


Heavy Duty Double Helix Augers

Extra Heavy Duty Flight Augers (shown with gravel guards)

Offset Boring Heads

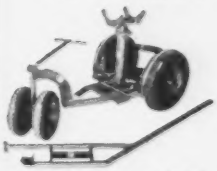
Heavy Duty Offset Boring Heads



Screw Bits for Small Holes

Pulling Eye

Screw Anchor Tool



Pole and Transformer chariot

PETERSEN ENGINEERING CO., INC.
Santa Clara, Calif. Dept. F6
Please send PENGO Tension-Stringing equipment data to:

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KOOL KOIL

FABULOUS NEW ADVANCE FLUORESCENT LAMP BALLAST...

guaranteed to operate 15 to 20 degrees cooler

up to 15% more light output . . . increases ballast life 3½ to 4 times

eliminates use of costly radiators

TECHNICAL DATA—ADVANCE KOOL KOIL BALLAST—CAT. No. RSH-2E75-S

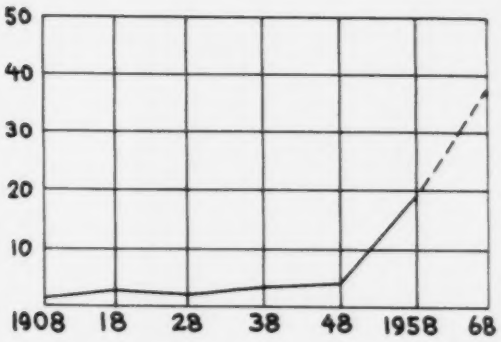
CATALOG NUMBER	LAMP TYPE	NOMINAL LAMP WATTS	RATED LAMP CIRCUIT M.A.	CIRCUIT VOLTAGE	LINE CURRENT (AMPS)	WATTS LOSS	OPEN CIRCUIT VOLTAGE	DIMENSIONS IN INCHES			
								LENGTH	WIDTH	HEIGHT	MOUNTING
RSH-2E75-S	(2)F96T12	74	430	118	1.5	24	775	14 5/16"	3 1/4"	1 25/32"	13 1/4"
	(2)F72T12	55	430	118	1.5	24	775	14 5/16"	3 1/4"	1 25/32"	13 1/4"

ADVANCE TRANSFORMER CO. • 2950 NORTH WESTERN AVENUE • CHICAGO 18, ILLINOIS

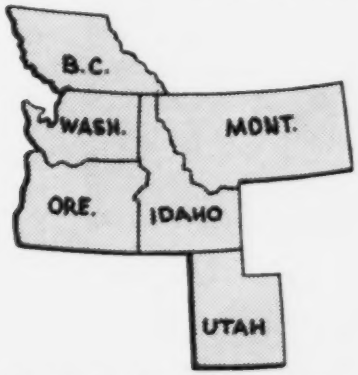
Celebrating

NELPA'S GOLDEN ANNIVERSARY

1908 - 1958



We've Just Begun To Grow



The Utility Members of the Association are building 2,488,000 kw of New Capacity of which 1,177,000 kw will come on the line during 1958.

Last year these companies spent $320,000,000 for Building Dams and other Capital Improvements. This year their budgets total $325,000,000.

Through cooperative efforts of all phases of the Electrical Industry, the area served by NELPA has become the most highly electrified area on the North American Continent.

The exchange of technical and promotional ideas between Electric Utility Companies, Electrical Manufacturers, Distributors, Service Agencies, Contractors and Retailers have paid off by making the people of the Northwest strive to "Live Better Electrically."

You do a lot better when you pull together. Are you pulling together as a member of NELPA? For Membership Information contact NELPA Headquarters today.

Associations Accomplish Those Things Which Most People Think Just Happen

NORTHWEST ELECTRIC LIGHT AND POWER ASSOCIATION

204 CORBETT BUILDING • PORTLAND, OREGON

Pick a date... any date!

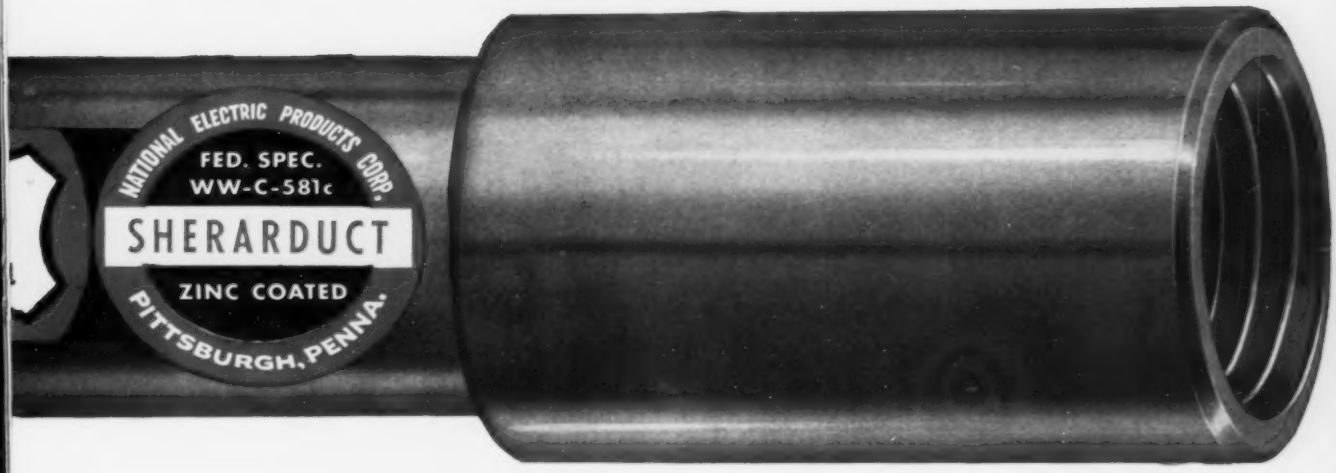
MAJOR PROMOTIONS
AIR CONDITIONERS
FREEZER - REFRIGERATORS
ELECTRIC HOUSEWARES (GIFTS)
JUNE
SUN MON TUES WED THURS FRI SAT
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30
TIE IN - PROMOTE - AND SELL

... and you'll find that the San Diego Gas & Electric Company has a dealer promotion going!

Twenty-four major and continuous annual campaigns — each a total all-out, all-media advertising effort. Plus two great trade shows a year — monthly dealer meetings — close organizational support via the San Diego Gas & Electric Company sponsored Bureau of Home Appliances and the Electrical Contractors Division. It all adds up to a full calendar of events (as displayed here by our Mrs. Stevens) . . . designed to create more gas and electric appliance sales for more dealers in more ways on more days!

SAN DIEGO GAS & ELECTRIC COMPANY

HERE'S *double* PROTECTION



NOW galvanized Sherarduct is coated with NEW

FORMULA MVC-1

the modified vinyl copolymer that provides the most effective barrier against corrosive agents of all kinds

National Electric has developed a new way to combat conduit corrosion. It is called Formula MVC-1, a new modified polyvinyl chloride resin coating that's available only from National Electric.

Here's what MVC-1 does to even further increase the protection against corrosion offered by the Sherardizing process of galvanizing.

RESISTANCE TO CORROSIVE ATTACKS—In accelerated salt spray, sulphuric acid and caustic tests conducted by the Pittsburgh Testing Laboratories, new Sherarduct with Formula MVC-1 far outlasted all hot dipped and other high-grade coated and galvanized conduits tested.

RESISTANCE TO FLAKING—Formula MVC-1 makes a tight, uniform, adhesive coating that withstands bending without cracking or flaking.

TEMPERATURE RESISTANCE—Formula MVC-1 is extremely resistant to high and low ambient temperatures and will withstand the majority of all industrial temperature conditions.

NOW ADD THIS NEW CORROSION RESISTANCE TO SHERARDUCT'S OTHER FEATURES

1. The Sherardizing process of galvanizing that alloys zinc with the conduit walls.
2. Normalized, highly ductile steel for easy bending and threading.
3. Zinc protected threads for complete end-to-end protection.

These are the features that convince architects, engineers and contractors it is best to specify National Electric Sherarduct when real corrosion protection is required. Write for complete information on new Sherarduct today.

Listed by Underwriters' Laboratories, Inc.

Sherarduct *with MVC-1* is Galvanized Conduit at Its Best

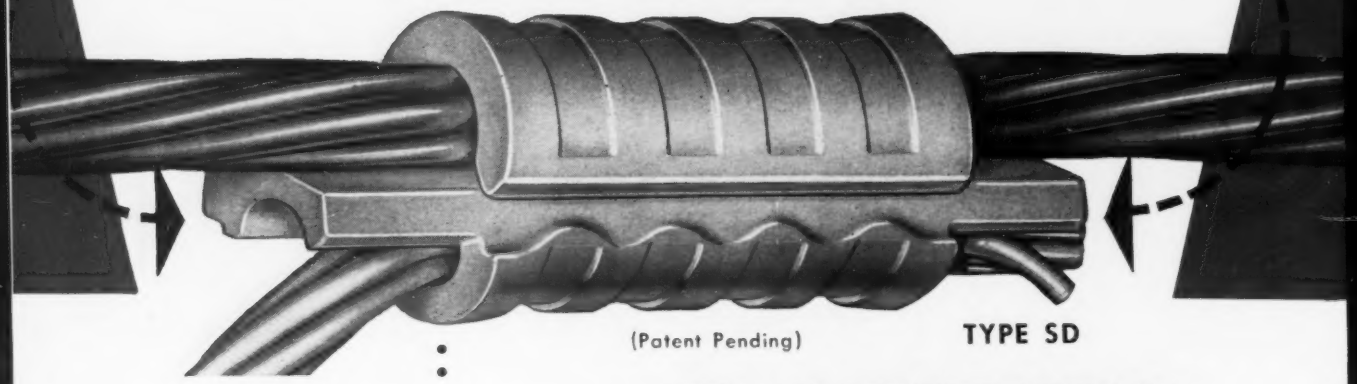
NATIONAL ELECTRIC PRODUCTS — WIRING SYSTEMS — WIRES AND CABLES

National Electric Products

PITTSBURGH, PA.

2 Plants • 12 Warehouses • 41 Sales Offices

Exclusive New
DRIP-GUARD
SEPARATOR



(Patent Pending) TYPE SD

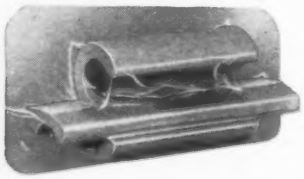
in BLACKBURN 6-Frame Tap Connector

- **Assures Separation of Conductors**
- **Provides Needed *Extra* Protection on Bi-Metallic Connections**

Type SF Recommended for Aluminum to Aluminum

This Blackburn 6-Frame Tap Connector assures complete separation and protection of the conductors. The Drip-Guard is unnecessary for this application.

Both Designs Available *Pre-Filled*

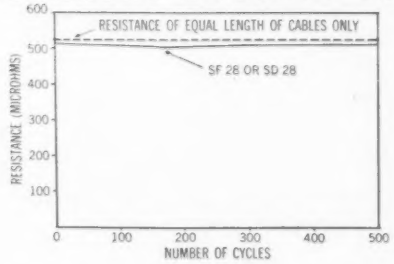


Type SD or SF may be ordered pre-filled with Blackburn's superior oxide-inhibiting compound, Contax. Pre-filling eliminates the possibility of an installation being completed without inhibitor.

Write for samples

LIVE BETTER ELECTRICALLY

CURRENT CYCLING TEST TELLS THE STORY



Current Cycling Test Conditions:

1. Cables: 4 Stranded Copper; 2 ACSR.
2. Cable operating temperature: 125° C.
3. Cycle: 2 hours "On", 1 hour "Off".
4. Length of connection: 24 inches.
5. Resistance of equivalent length of wire: 522 microhms.
6. Cables were wire-brushed, but no protective compound was used.
7. Curves represent an average of seven tests.

This rugged Blackburn design provides protection for conductors from both galvanic corrosion and physical damage. The Blackburn Drip-Guard Separator, plus the completely enclosed tap, prevents corrosion products from bridging the gap between the copper and aluminum conductors. Copper wire now can be used as main or tap without corrosion damage to the aluminum conductor.

In addition, the superior Blackburn design, which incorporates external channels parallel to the tap hole, assures uniform encirclement of both conductors when compressed.

Shot-blasted surfaces protected by an oxide-inhibiting film insure oxide-free connectors at jobsite.

JASPER BLACKBURN CORPORATION • 1525 WOODSON RD., ST. LOUIS 14, MO. Wydown 3-9636

PARDON OUR PRIDE!

Let us tell you about our Life Members, as we are very proud of them. There are now 292, and their names comprise an Honor Roll of the electrical industry.

When a member, with at least 20 years of continuous membership to his credit, retires at 60 years of age or over, he becomes a Life Member of PCEA.

Through the Association mailings, which he receives without further payment of dues, he is able to keep in touch with what is going on in his industry, and with the activities of long-time friends and fellow-workers. Many of these Life Members drop in at the Conferences and Conventions whenever possible.

It is a very real tribute to the electrical industry that it continues to hold the affection of those who are no longer bound to it by daily toil, but who retain a deep-rooted pride in the part which they have played in making its service so dependable, and so essential to modern living.

PCEA

PACIFIC COAST ELECTRICAL ASSOCIATION

530 W. Sixth St. Los Angeles 14

681 Market St. San Francisco 5

JASPER BLACKBURN CORPORATION • 1525 WOODSON RD., ST. LOUIS 14, MO.

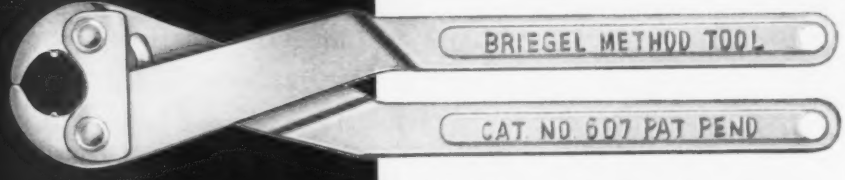
B-M THE ORIGINAL INDENTER FITTINGS

Over 25 Years of Proven Performance

Permanent locked-in bushing insures smooth burr-free raceway for easy fishing. No extra work.

BRIEGEL RED THROAT

1. Protruding rounded red plastic lip of bushing prevents cutting of insulation—eliminates shorts.
2. Full thread screws into all conduit fittings. Lip of RED THROAT bushing protects thread from damage.
3. Deep dished eight pronged lock nut is easier to drive on—screws flush to shoulder and digs into metal of box for vibration proof positive ground.
4. Two quick squeezes with The Briegel Indenter and BM All Steel Indenter Fittings are set forever. Metal is pressed into metal for permanent installation and positive ground.



NEW POCKET SIZE INDENTERS

Just 10" long, these new patented compound leverage indenters are only plier size. Lighter to carry and easier to use—the leverage does the work. No. 607 for ½" and No. 608 for ¾" fittings.

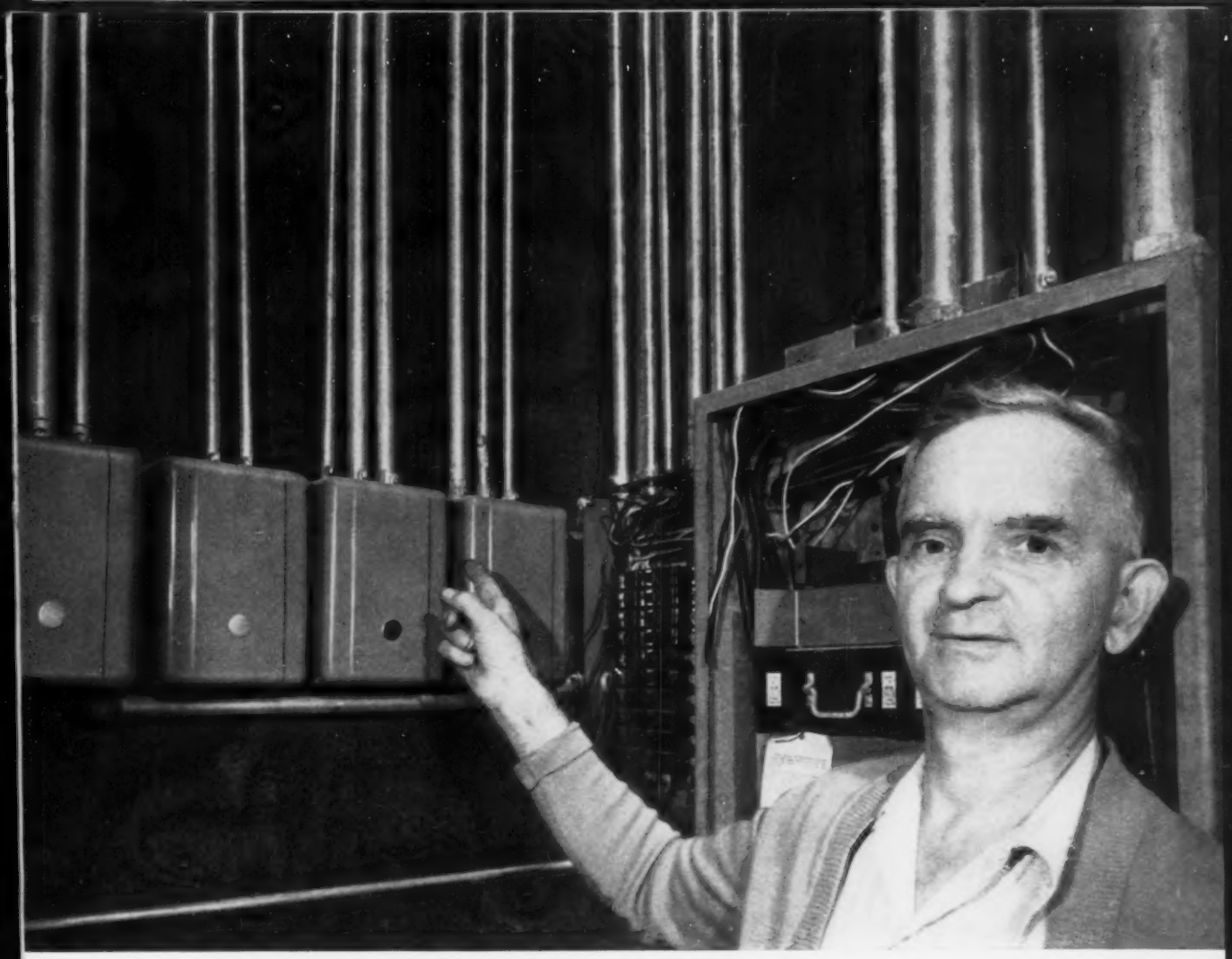
BRIEGEL METHOD TOOL COMPANY

GALVA, ILLINOIS

All B-M Indenter Fittings are U.L. Approved as concrete-tight and for general use (File Card E10863). Also comply With Federal Specifications W-F-406.

TELESCOPE BM SYSTEM

ALL BRIEGEL FITTINGS ARE U. L. APPROVED AS CONCRETE-TIGHT



"SPANGLEAM EMT," reports Mr. Pinney, "assured us easy, economical installation and dependable performance."
Mr. Pinney points out the SPANGLEAM installation at the parochial school, Fairhaven, Vt.

"SPANGLEAM EMT helped us reduce installation costs by 33%"

says Chester S. Pinney, Owner of
Pinney Electric, Rutland, Vermont

"We needed an electrical conduit which was light, economical, easy to handle and bend for the electrical systems at the parochial school in Fairhaven, Vt. and at the elementary school in Proctor, Vt.," states Mr. Pinney. "SPANGLEAM EMT gave us all this and actually saved us 33% in labor costs normally required to install rigid conduit.

"Installation was a simple matter: SPANGLEAM EMT was easy to bend, and connections were made merely by forcing the EMT into the fitting.

"I have used SPANGLEAM EMT for many years and know that it gives excellent protection to electrical wiring. It is sturdy and has good corrosion resistance. The smooth interior finish insures quick, easy wire pulling."

SPANGLEAM EMT WILL GIVE YOU THESE SAME RESULTS TOO!

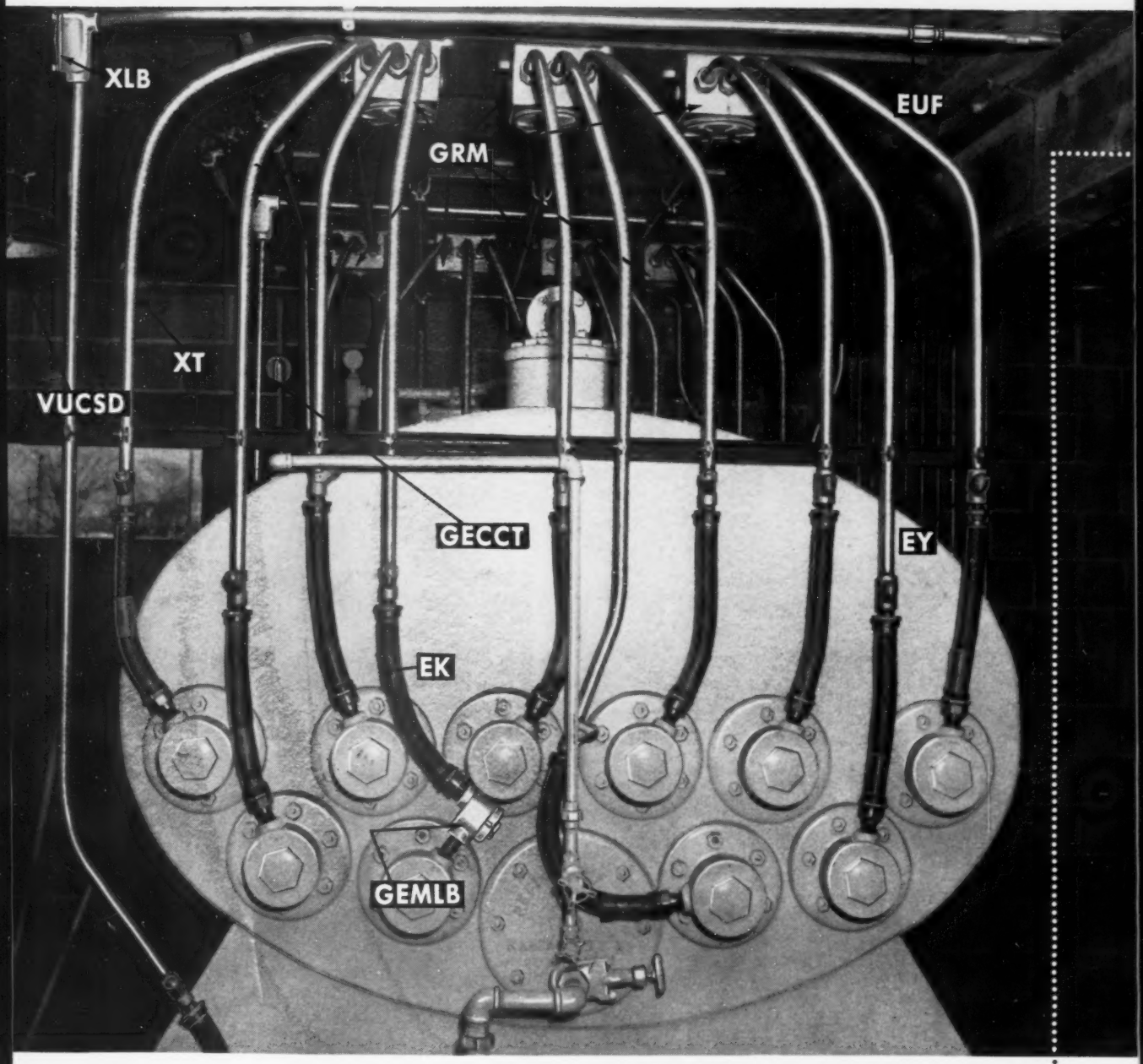
SPANGLEAM EMT is manufactured under strict *quality-controlled* methods and is thoroughly inspected to insure you of dependable performance. On your next electrical construction job, use top-quality conduit . . . use SPANGLEAM EMT. Your local Spang Distributor will be glad to serve you.

General Contractor: Donald C. Noyes, Rutland, Vt.
Architect: Dirsa & Lampron, Manchester, N.H.
Electrical Contractor: Pinney Electric, Rutland, Vt.
Spang Distributor: Vermont Electric Supply Co., Rutland, Vt.

SPANG® CONDUIT

SPANG-CHALFANT
Division of The National Supply Company
GENERAL SALES OFFICE:
TWO GATEWAY CENTER, PITTSBURGH, PA.
District Offices and Sales Representatives in Principal Cities

Oil Treating Plant Specifies



This photo shows one of the Hudson oil treating machines, to which are installed a number of necessary Killark Flexible Couplings. On the ceiling are Killark Explosion Proof Junction Boxes. In the box at the right are enlarged photos of the Killark units used (and numbered) in this installation.

ELECTROLET KILLARK SPEEDOLET

K KILLARK ST. LOUIS

Killark

ELECTRIC MANUFACTURING COMPANY

Vandeventer and Easton Aves. St. Louis 13, Missouri

KILLARK Explosion-Proof Fittings

Attractive Alumalloy Construction Offers Protection, Strength, Freedom from Rust and Corrosion

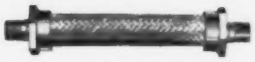
XLB Junction Box

XT Junction Fitting

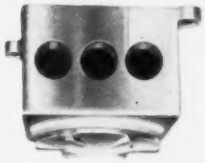
VUCSD Lighting Fixture

EY Sealing Fitting

GECCT Junction Box

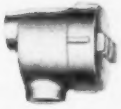


EK Flexible Coupling



GRM Junction Box

EUF Union

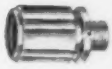


GEMLB Junction Box with Sealing Cover (GEMEY)

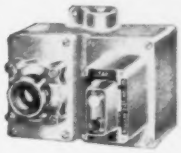
The installation shown here is for oil processing equipment at the Hudson Oil Company plant in Kansas City, Kansas. It is significant testimony to the efficient, safe design of Killark Explosion-Proof Fittings that were used throughout the job.

Electrical Contractor—
Great Northern Electric Co., Kansas City, Kansas
Killark Representative—Wm. B. Terry Co., Kansas City, Missouri

GRD Junction Box (with sealing cover)

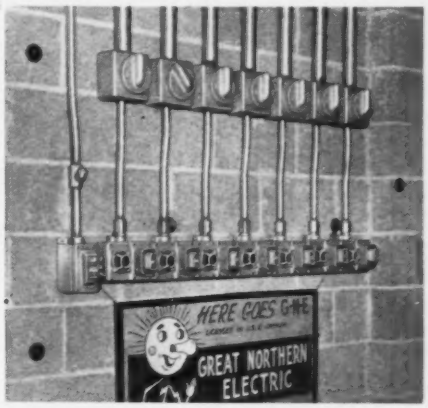


EUM Union

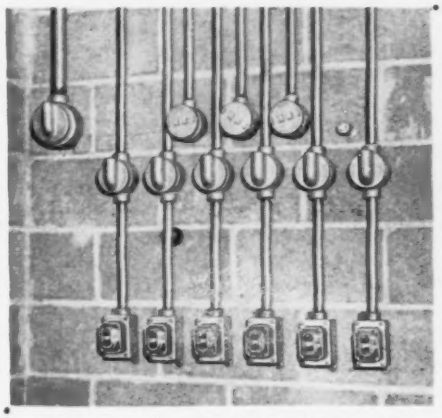


2XPLBM Pilot Light and Push Button Station

EY Sealing Fitting



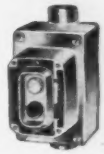
Battery of push button and pilot light units which operate the oil treating machines. Actual units shown enlarged in the attached inset.



GESLBT with sealing cover

GECLBT Junction Box

GECCT with sealing cover



XPBM Push Button Stations

These "start" and "stop" stations will control operations in other parts of the plant now under construction. Actual units shown enlarged in inset.

Killark Representatives will gladly offer their assistance on design and specifications for your installations.

KILLARK REPRESENTATIVES

Denver 4—Kenneth B. Schumann Co., 1073 Galapago St.; **Honolulu 11**—Matt Cabot & Associates, P. O. Box 3708; **Los Angeles 33**—Kenneth Anderson Co., 123 South Myers St.; **Phoenix**—Kenneth Anderson Company, c/o Mr. Melvin C. Long, 422 S. 7th Ave.; **San Francisco**—F. M. Nicholas Co., 714 Harrison St.; **Seattle 4**—Northwestern Agencies, Inc., 4130 First Ave., South

ELECTRA'S HUSBAND

"The Soft Sell"

THE visitor in my office was the sales manager of a fairly large electrical manufacturing company. Naturally, the conversation veered around to current business conditions. We were at the point where the current palliatives for the business recession were being picked apart.

"I'm just about convinced that the best cure for the business slump is to get everybody to work a little harder," said the SM. "And I mean salesmen in particular. The old saw that 'nothing ever happens until a sale is made' is just as true today as it was when it was first uttered. There's nothing wrong with the business picture that a few more sales wouldn't cure."

"Now don't get me started on that subject," I replied, "the whole nation is oriented in the direction of doing less real work for more pay —and the philosophy is not confined to the labor unions, either. The kids all have to have college educations so they won't have to get their hands dirty; all of the emphasis is on what to do with your leisure time from basement workshops to building model boats inside bottles. Everybody seems to be seeking personal recognition and personal achievement, not from the job that they do, but from being the best yo-yo player or canasta wizard."

"True, true," sighed my friend. "I'd be afraid to count just how many of my salesmen look upon their job as a means to an end, and how many of them set a self-imposed quota that will get them by and give them the wherewithal to golf, fish or play games."

"We are not alone in this kind of thinking." I pulled out an article in a current business magazine. "Here's the report on a speech made by the head of one of the country's biggest advertising agencies recently. He says that one of his friends who has been to Russia stated that the Soviets are going to pass us technically in a few years because over there everyone is working hard, and over here everybody is busy thinking how to get someone else to do his work. He went on to point out that we comfort ourselves by saying that our productivity is increasing, but the truth of the matter is that human productivity decreases every year and it is the increased productivity of our machines that hides the human failure. He thinks that somehow there must be a return to the old-time pride of craftsmanship, and even suggests that some Oscars ought to be given to people who do outstanding jobs, whether they be streetsweepers or scientists."

"You'll pardon me if I keep coming back to selling all the time. Doing a good sales job is hard work—maybe too hard for the mood that most people seem to be in these days. They talk about this as being the year of the 'hard sell,' but there's not much indication that anybody is really out beating the bushes to convince people to part with some of their cash or savings.

"Have you heard about the little test that was made at a recent meeting of an advertising club in Cleveland? Well, at this luncheon, a little questionnaire was passed to each one of the group. The questionnaire asked: 'Has anybody since January 1, by phone or in person, asked you to buy any one of the following: an automobile, home appliances, office appliances, a house, a fur coat, a new suit of clothes, new furniture, membership in a club, insurance of any kind, a color TV set, a hi-fi set, a vacation tour?'

"Now, there were over two hundred people there, and 27% of them answered 'no' to all of the questions. You won't like this, but only 4% of the group had been asked to buy home appliances. Less than 1% had been asked to buy a color TV set. And only 16% had been approached by an automobile salesman. Well, the list goes on like that, and it only proves to me that salesmen as a group are not only not selling—they're not even asking for the order."

"Looks like you sales managers have a job cut out for you," I grinned. "Didn't you just get back from this fancy school where you learned all about motivating, stimulating and organizing?"

"That I did, but they taught us more about holding out carrots than they did about instilling pride in good workmanship. Doing that is everybody's problem.

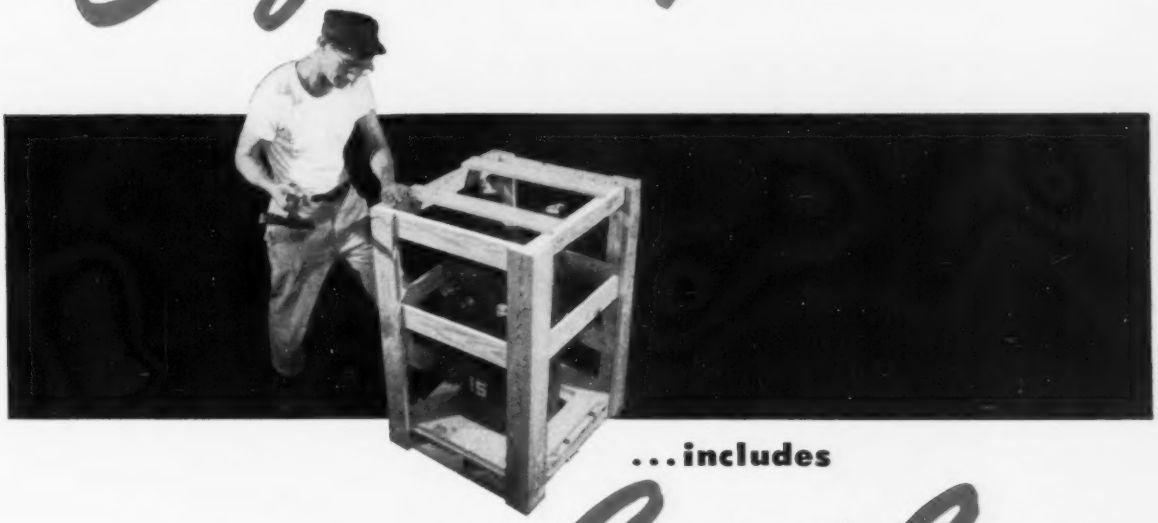
"Did you ever see a real 'hot' salesman at work? He not only radiates confidence and enthusiasm but he exudes pride in his job of doing something for the customer. That kind is hard to come by these days—and maybe it's because we sales managers have grown soft too. I wonder if my crew thinks that I radiate confidence, enthusiasm and pride in my job or that I'm just a handy guy with the needle?"

"I think that all of us have had it a little too easy since the war," I commented, "but between the sputniks and the recession it may well be that the virtues of just plain old-fashioned hard work could become rather painfully apparent. Right now I think the country is relying rather heavily on the ability of the salesmen to step up the quality and the quantity of their pitches.

"Nicholas Murray Butler, when president of Columbia University, made the observation that the world is made of three groups of people. The first group, a very small one, makes things happen; a somewhat larger group watches things happen; and finally, the great multitudes who don't know what *is* happening. Well, I think you've got to put the salesmen in the first group. Until they function, nothing much is going to happen. Maybe all you sales managers ought to get together and build a campaign to 'sell something every day.' It wouldn't take long to work down the inventories on everything if every salesman got an order every day."

"Amen to that—now you can take me out and buy me the best lunch in San Francisco."

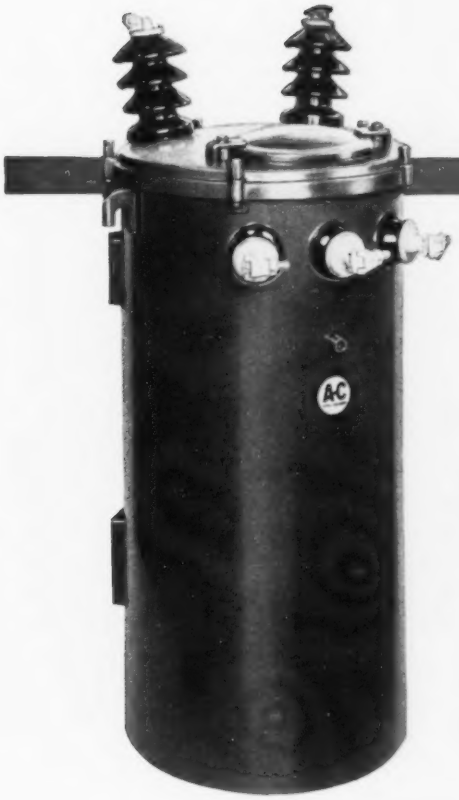
Craftsmanship at Allis-Chalmers



...includes

Careful Crating

of Distribution Transformers



Advanced engineering and manual skill at Allis-Chalmers extend even to the crating operation. Exhaustive shock tests of crate designs combined with care in manufacture assure safe arrival of shipments . . . protect the outstanding performance and long life built into every Allis-Chalmers distribution transformer. You save time and money in handling costs, as sturdy construction of crates keeps damage to a minimum. Each crate bears the seal of approval by the National Safe Transit Committee.

Pallet base facilitates safe, easy handling

The pallet base of the Allis-Chalmers transformer crate affords the speed, convenience and safety of fork truck stacking . . . promotes maximum utilization of valuable space. Because of its sturdy construction, the crate base may be reused for your own materials handling and storage.

For the complete craftsmanship story, see your Allis-Chalmers representative or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5487

SUPPLIERS FOR WESTERN USERS

ELECTRICAL

transmission, distribution, communication

EQUIPMENT

Sales Offices and Warehouses

★ San Francisco	7	870 Tennessee Street	ATwater	8-6900
★ Los Angeles	13	427 W. Fifth Street	MUtual	7245
★ Phoenix		324 S. Second Avenue	ALpine	3-9595
★ Portland	10	2318 N. W. Vaughn Street	CApitol	8-4173
★ Seattle	9	306 Dexter Avenue	SEneca	2368
• Spokane	8	121 S. Monroe Street	MAine	4-4326

MAYDWELL & HARTZELL

INCORPORATED

Engineering Sales Representatives

ELECTRICAL BOOKS

SMALL APPLIANCE SERVICING, 180 *pages*, 5½x8¼, *by P. T. Rockwell, Jr., McGraw-Hill Book Co.*, $4.50.

This is a manual that will help any reader with a basic understanding of elementary electricity to do many profitable jobs of repairing household electrical appliances. The book gives the operating principles and construction of basic appliances—enabling the reader to understand any make or model. It also presents the testing and servicing techniques that help make repairs speedily, efficiently and economically. In addition to servicing methods, the book gives pointers on starting an appliance servicing business and making it pay on good business ethics.

ELECTRICAL ENGINEERING CIRCUITS, 724 *pages*, 6x9, *by Hugh Hildreth Skilling, John Wiley & Sons*, $8.75.

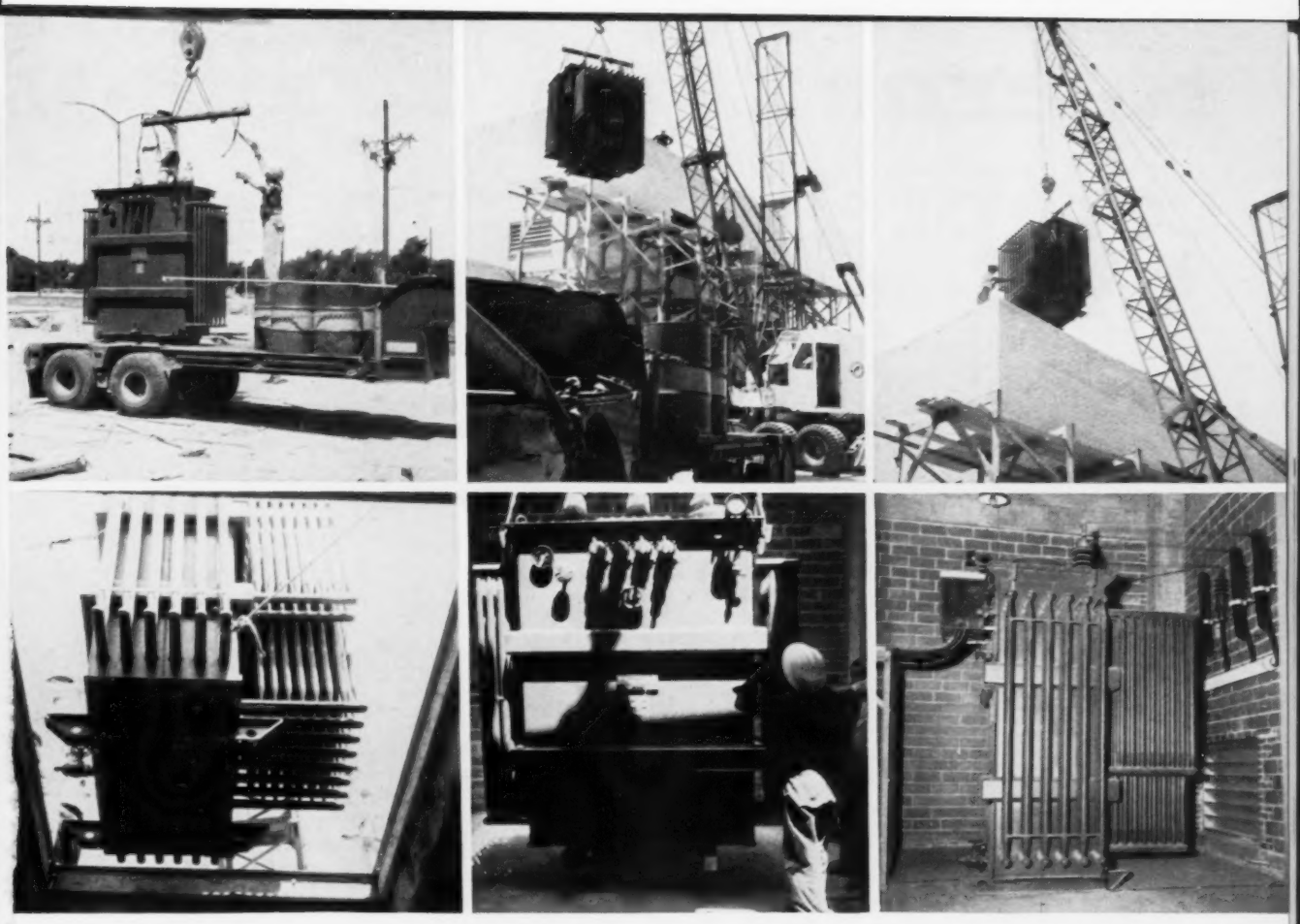
This presentation of a-c circuits accomplishes a two-fold purpose. It gives students a foundation in the subject by devoting about two-thirds of its coverage to traditional topics. Second, it offers discussions of newer concepts, preparing students for advanced courses in electrical networks and system design. The text is designed for a full year's use. Among the modern concepts covered are: network theorems, loop and node equations of networks, locus curves and other graphical methods, resonance of high-Q circuits, impedence and admittance functions, and others.

INTRODUCTION TO ELECTRICAL APPLIED PHYSICS, 241 *pages*, 6x9, *by N. F. Astbury, Philosophical Library*, $10.

During the past 25 years or so, electrical science has developed in such a way that, effectively, a new subject has grown up that is neither physics nor engineering in the ordinary way. The author has felt, both as a practitioner and later as a teacher, that there should be some change of emphasis in textbooks planned for the senior university students in physics or engineering. This book is an essay in this field. An attempt is made to bring together the classical basis of the subject and the elements of some specialist topics that are finding their way into all fields of applied science.

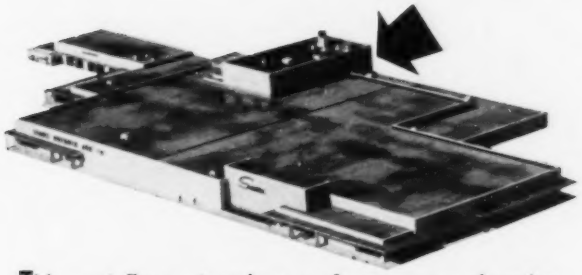
ELECTRICAL CONSTRUCTION COST MANUAL, 431 *pages*, 6x9, *by Ralph E. Johnson, McGraw-Hill Book Co.*, $10.

Electrical estimating, the tedious and costly part of electrical contracting, has been given the business machine treatment by analytically minded Ralph Johnson, president of Sturgeon Electric Co., Denver. The book contains the essence of Johnson's Estimatic system in full detail. By arranging unit assemblies of materials typical to all jobs and working up shorthand codes of them, the system not only estimates labor and materials far more accurately but gives the electrician working drawings of each unit and the contractor a delivery schedule for all the materials to be sent to the job. It is perhaps the greatest advance in streamlining of estimating that has yet been introduced into the construction industry.



POWER ON THE ROOF INCREASES EFFICIENCY...

at Sears' new Amarillo shopping center



This new Sears store is one of many new shopping centers springing up in growing Amarillo, Texas. Following the modern trend, all floor space has been devoted to merchandise and display. Air-conditioning and operating equipment is installed on the roof—out of the way.

To put power where it was needed—on the roof to eliminate the losses and expense of long secondary copper runs—Southwestern Public Service Company selected Kuhlman. A regular user of Kuhlman, Southwestern knew from past experience that Kuhlman transformers would provide the required reliability. Then, too, like all Kuhlman customers, wherever they are located, Southwestern benefits from the close, friendly service of a nearby Kuhlman factory.

Whether it's distribution or power, for industrial, commercial, or residential use, you'll find Kuhlman transformers are designed to meet standard specifications as well as special conditions. Talk over your requirements with your Kuhlman representative. He lives in your area and knows your needs.

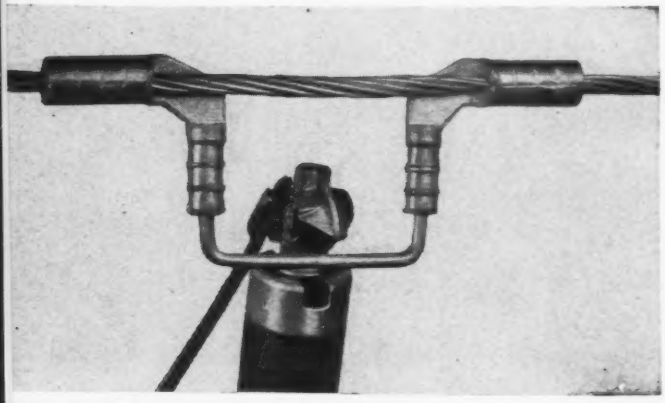
KUHLMAN ELECTRIC COMPANY

General Offices: Birmingham, Michigan

WESTERN DIVISION • SALINAS, CALIFORNIA

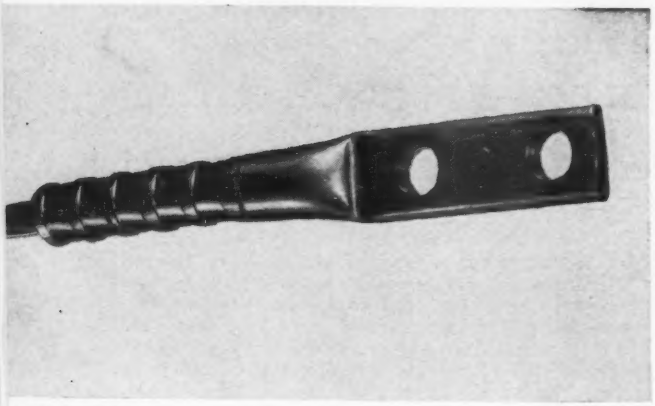
Kearney's compression program

Added versatility and increased application with existing tools—that's what an investment in Kearney Compression can mean for your system. Besides the basic connections—Squeezons, Serv-En Service Entrance Sleeves, Tension Sleeves and others—you receive the advantages of ever widening tool flexibility as Kearney Engineers continue to develop and introduce new Compression Fittings to the field.



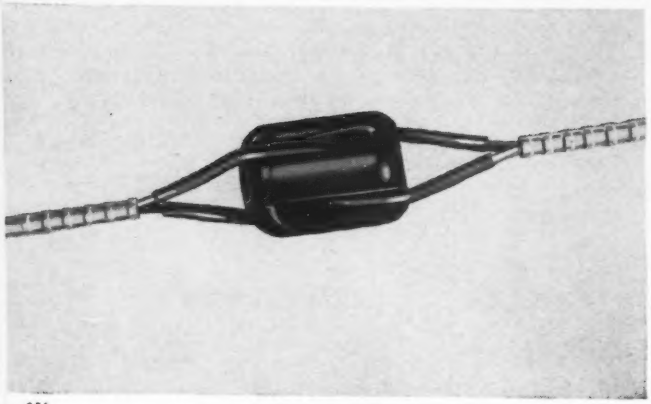
KEARNEY L Squeezon Stirrup

Line side connections are outside the basket—sufficient clearance for either the hydraulic or mechanical tool. The three inch dimension between the line and stirrup makes the unit neat and compact—hot line clamps are readily installed. Unit may be completely covered with line guards.



KEARNEY Compression Terminal

Kearney Compression Terminals provide an efficient method of connecting aluminum conductors to terminal pads. Flaring of strands possible with conventional terminal pads is eliminated. The strands are retained in an aluminum sleeve. Terminals have NEMA 1¾" bolt centers. May also be used as disconnectable jumpers around double dead-ends. The sleeves are filled with Kearnalex Contact Aid and capped and will take conductor sizes from 1/0 to 397.5 MCM 18/1 ACSR.



KEARNEY Insulated Splice

The Insulated Splice was designed primarily for splitting secondaries into shorter sections where additional transformers have been installed and for series street lighting applications. No changes in existing construction are required. Designed for copper, aluminum and ACSR connections, this splice features one piece construction, tension-type sleeves, insulated stainless steel bails and a high strength strain insulator. Splice can be installed with Kearney Hydraulic or Mechanical Tools. ACSR and aluminum sleeves are packed with Kearnalex Contact Aid and plastic capped.

391

pays extra dividends

KEARNEY INSIDE TAPERED COPPER SLEEVE

A completely new, cost-cutting design—another Kearney "dividend"—permanent, positive, full tension splicing of energized conductors with standard Kearney tools and dies.

ADVANTAGES—

1. **Metallizing process**—copper sleeve is sprayed internally with conductive metal to assure maximum holding power and high conductivity.
2. **Full Inside Taper**—design assures ease of insertion of hot conductors—also relieves stress, due to vibration, at the extremities of the sleeve.
3. **Shorter Length** means less installation time, fewer crimps and no sacrifice of holding power—sleeve is more easily stored.
4. **Clearly marked** with conductor and die sizes.

KEARNEY WH-1 TOOL

A rugged, reliable hydraulic tool which expedites the installation of Kearney compression fittings and sleeves. Hi-speed, two-valve pump permits fewer strokes for full compression—exerts 21,000 pounds thrust. The narrow "C" head permits full visibility of the working area. Balanced weight enables the lineman to position the tool quickly and accurately for each indent. Interchangeable, insulated wood handles with extra length are available for working higher voltages.

FOR BETTER CONSTRUCTION—SAFER MAINTENANCE

Specify Kearney Products

IN THE WEST: for prompt service, contact Kearney's West Coast Distributor, **Maydwell and Hartzell, Inc.,**
Los Angeles • Seattle • Portland • San Francisco • Spokane • Phoenix.

PLANTS AT: ST. LOUIS • FAYETTEVILLE, ARKANSAS • SHENANDOAH & CLARINDA, IOWA • GUELPH, ONTARIO, CANADA

JAMES R. KEARNEY CORPORATION • General Offices: 4224-42 Clayton Ave., St. Louis 10, Mo.

editorial views

"Statistics"

FEDERAL POWER COMMISSION reports indicate that electrical energy production for January was below that of the previous year by 0.3%—the first time that a decline has been registered since July of 1946. Preliminary figures for February, however, indicate that the privately owned electric utilities registered a dollar gain for the month of 4.5%, although the net income increased by 2.3%.

This is not the whole story. Residential load and revenue have again demonstrated that the domestic customer is a bulwark of utility earnings. Even back in the depths of the depression of the 1930s, residential power sales rose 1.2% in the worst depression year, while commercial use went off 10.6% and industrial use 16.2%.

In January, industrial kilowatt-hours were down 7.8%. A recent study by a New York security house revealed that, despite economic highs and lows, revenue from the sale of residential power has grown on an average of between 8 and 10% per year every year since the end of World War II. It may not take much promotional effort to keep up that very gratifying pace—but it does take effort.

What Price Democracy?

WITH the current emphasis on defense and accelerated scientific achievement, dollars spent by the federal government for nonessential civilian programs are bad enough. Inexcusable are dollars that represent duplication, working at cross purposes and simple boondoggling.

In the 1959 federal budget expenditures are proposed that would make even the most casual observer raise his eyebrows. On one hand the Department of Agriculture wants to spend $756,000,000 in the soil bank to remove land from production. At the same time the Department of Interior wants to spend $216,000,000 to get more land into production through dams and irrigation systems. The Commodity Credit Corp. intends to spend $2½ billion to remove surplus farm produce from the market while other government departments are spending $111,000,000 for soil conservation and $232,000,000 for agricultural conservation.

This is a time when rigid government economy is critically urgent in order to get the dollars needed for defense. Citizens have a right, and a duty, to make it known to their congressmen that the pork barrel, the demands of militant minorities and the schemes of the do-gooders are not the props to shore up survival in the space age.

"Pessimist – Optimist – Realist"

"THE STATE OF MIND of large groups is, in itself, an economic fact." This statement by a former chairman of the Federal Reserve Board is being borne out today. Behind every economic statistic there are decisions of human beings and human beings can be either fearful or confident. Some loss of confidence has already tightened up consumer buying—without any real basis of economic fact. That this is recognized by some fairly important segments of the American economy is indicated by the two campaigns that were announced last month to fight the recession with a campaign of confidence.

The Advertising Council is urging the various segments of the American press to mobilize the facts that can talk us, as a country, into a more confident mood. And it's not difficult. As of now we have more than 62,000,000 people employed; family income after taxes is at an all-time high of $5,300; individual savings have reached the highest level ever, $340

PLANTS AT: ST. LOUIS • FAYETTEVILLE, ARKANSAS • SHENANDOAH & CLARINDA, IOWA • GUELPH, ONTARIO, CANADA

billion; four million babies arrive a year and our prosperity curve has always followed our population curve. As the council says, no one can read these facts and stay a pessimist.

On the other hand, no one can deny that there has been a shrinkage in economic activity, however small. Five million people out of work is not a desirable situation. But it is possible to take the slack out of the employment situation rather quickly by restoring buyer confidence and stimulating buyer action.

General Electric has put the forces of its 280,000 employees, 385,000 shareholders and 400,000 dealers behind "Operation Upturn," a program designed to add confidence and strength to the nation's economy by "selling our way out of the recession."

It is predicted that more businesses will get behind the idea of telling and selling the customer. It's plain good business, it's a sure way of building confidence and it's a quick means of adding to man-hours of employment the country over.

"New Target"

CAN AMERICAN EDUCATION pay the price necessary to attract top talent into engineering teaching careers? This question was asked in a recently released report by the American Society for Engineering Education. An ASEE committee spent two years analyzing the needs (and the costs) of turning out the engineers required by industry in the next decade.

In brief, the report stated that, by 1967, American engineering colleges will need 7,000 more engineering teachers to bring the total of their engineering faculties up to 16,000. The salaries of these teachers should average $12,500 in 1967 dollars, 105% more than today's average. The total salary bill should be about $200,000,000, an increase of 233% over today's price tag.

These new teachers will be required to meet an undergraduate engineering enrollment that will be 66% above today's figure. This means there will be some 415,000 engineering undergraduates 10 years hence and that the present graduate enrollment of 25,000 will be doubled.

The report also states that there is a present-day shortage of approximately 8% of competent teachers and this is already significant. "Subtle, creeping compromise with quality faculty standards is already reported by many deans."

The report goes on to state that, to make engineering teaching at least competitive with other opportunities for well-qualified engineers, the present average professorial salary of $900 a month should be raised to $1,350 a month. Instructors should be raised to $700 from the present average of $487 per month. In the future educators' salaries must keep pace with those of general industry.

U. S. business and industry has the greatest stake of all in competent and adequate educational facilities at the collegiate level. Any weakness that militates against the competence and capability of future generations of engineers cannot be tolerated either from an economic or a strategic standpoint. If the conditions revealed by this report are true, and there is no iota of doubt that they are not, then the situation is alarming. Reports, however, valuable in revealing facts, will not produce results unless someone takes the initiative and does something about them.

And that is not all. Even assuming that the educational plant is brought up to par, the student output will not be "specialists." Educators now say that industry must do more "in-service" education to get the highly trained people needed. There's a big job ahead.

The editor would be interested in any suggestions from his engineering readers as to how the electrical industry can participate in corrective action.

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Bill
METER SUPERINTENDENT

ELECTRICAL WEST
SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
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Douglas B. McGregor
Arizona PS
Power Company

Leonard Hobbs
Smoot-Holman
Manufacturer

J. Clyde Soden
Soden Wholesale Elec.
Distributor

George Hawley
So. Calif. Ed.
Moderator

J. Clark Chamberlain
BHA of SD
Retailer

C. A. Wikle
A. S. Schulman Elec.
Contractor

Jean Rindlaub
BBD&O
Customer

Victor W. Hartley
PCEA
Assn. Executive

"Progress Through Teamwork"

Just what is the role of associations in electrical industry activities? This question was at least partially answered by a panel at the annual convention of the Pacific Coast Electrical Assn. held at Coronado last month. Their discussions reviewed the benefits, activities and accomplishments of past association operations, as well as suggesting new areas where work might be fruitful.

Coordination – Out of the comments of panelists came the consensus that the coordination of industry efforts was a primary function of a "horizontal" association such as PCEA. The panelists, representing vertical groups within the electrical industry, such as contractors, distributors and retailers, all of whom have "vertical" associations, each with its aims, objectives and programs. The panelists seemed to feel that PCEA, and its similar associations, provided a means of obtaining a mutuality of interests and a coordination of efforts between these intra-industry groups—all of which led to the overall progress of the electrical industry.

Specific items that were mentioned as essential services performed by all-industry electrical associations included (1) efforts to obtain uniform codes and ordinances; (2) effective use of promotional material made available for customer use and information by manufacturers; (3) coordinating national campaigns to get full support of all branches of the industry; (4) unification of plans for industry shows and fairs; and (5) sponsorship of new industry standards.

Customer Contact – Another important phase of association activity lies in its contact with and education of groups of customers. Emphasized by the panel was the work that PCEA committees have done with school authorities in providing data on proper school lighting; cooperated with traffic and highway authorities in developing traffic safety lighting; worked with architects and consulting engineers on lighting and adequate wiring.

Another long-range benefit is the work being done by the home economics departments of various utilities in working with domestic science teaching groups, bringing them the latest information developed by our industry on cooking and homemaking.

Comments from the various panelists pointed out the importance of having groups from PCEA work with groups of users of the various services our industry provides.

Customer Viewpoint – Mrs. Jean Rindlaub, a New York advertising executive and a speaker on the program, presented the customer viewpoint toward the electrical industry. In all sincerity, she pointed out that her counterparts across the nation seemed to have less and less contact not only with the electric utility that serves them but also with the other industry groups, such as the contractors and dealers. Outdoor metering, automatic billing and mass selling via TV have practically eliminated the personal contact with the customer.

One comment of particular import indicated that the average customer knew far less about the electric utility and electrical industry than most people within the electrical fraternity had been led to believe. Customers apparently don't even know where to turn to get the desired information. An example of this situation was given in the difficulty of finding out the latest styles and recommendations for home lighting. Customers apparently experience trouble in getting information even on this most basic service.

Training – Associations apparently are considered a very good training ground, both for people within their own organizations and for outside groups whose activities impinge on electrical industry oper-

(Continued on p 130)

"Action . . . in the Common Interest"

George N. Hawley
President
Pacific Coast Electrical Assn.

This has been a busy year for your association and its officers. Quick changes in our industry's problems have shown the value of a flexible association program, and we have been able to keep pace with the changing emphasis required.

I cannot let this opportunity pass without public acknowledgment of my very great, personal indebtedness to the members, officers and directors who, by their hard work and willing cooperation, have made this association year inspiring and productive.

In my 30-odd years in the industry, I have not seen such a demonstration of close teamwork between representatives of all phases of the electrical business. This, it seems to me, is the very reason for the existence of associations like ours which bring together industry-wide problems and viewpoints for discussion and action in the common interest.

Our industry is under attack by those who would socialize the nation. This is not only because of the key position of this business but, as Economist John K. Galbraith points out, because the power business is "administratively feasible." That is to say that a power company can be run acceptably if not as efficiently by government direction. While this is not true of many businesses, it remains true of the utilities, pipeline companies, producers of petroleum, coal, steel—most of the extractive industries. All are in line for attack from the left. In perspective, it is surprising that these interdependent key industries have not created a strong natural alliance for their common defense. How come?

Unfortunately, it is the propensity of business management to concentrate on the immediate problems to the neglect of the vital long-range threat to the whole. We are today concerned with sales volume and profit. We concern ourselves with raising prices, looking for a larger share of the market. We shop for cheap money. We beef up our sales force. But, in each case, we are treating symptoms rather than the disease. The reason for our concern is being generated by the increasing centralization of social control beyond the perception of many of us.

It seems apparent that in the unique character of PCEA, embracing as it does all the vital elements of the electrical industry, we have at hand a prime vehicle for stimulating necessary industry-wide cooperation. I believe PCEA is that place to which we can repair to view our larger mutual problems.

In this regard, one of the undertakings of the association this year has special significance. I refer to the practice of members of your board sitting in at various sessions of our several conferences and the stimulation of attendance by executives of our member companies. This has several worth-while results. It gives our board members close contact with the objectives and problems of each of our major committees so that they are better able to function on matters of policy concerning our over-all objectives. It reinforces the concept of mutual helpfulness between segments of the industry. It displays the talents of our upcoming younger men to the executives of their companies, and thereby makes committee work an integral part of the process of management development. I would recommend to future administrations the continuance of this worth-while practice.

Closely allied to this has been the work of our manpower development committee. This group has made notable strides in reinforcing the vital connection between the industry and the educational institutions which furnish the bulk of our trained manpower supply. Through the efforts of this group, direct contact has been made with graduating students and their professors with forthright information on the challenging and vital aspects of the industry. The strengthening of our mutual relationships, alone, has been worth the effort and, while the manpower supply problem has been alleviated by current conditions, the major problem of understanding our industry still remains. I would recommend the continuance of this essential program.

Time does not permit a review of all the significant accomplishments of the year. I have picked two or three to establish the emerging pattern of industry-wide solidarity which has always been a basic concept of your association but which in these recent years has been effectively promoted and enlarged through the informed and willing cooperation of all of the PCEA members.

I commend to the keeping of oncoming administrations the guardianship of these precious values that we may continue "Living Up to Our Heritage."

PCEA Pres. Hawley, Cal Tech Pres. Lee DuBridge speaking

Host Company Pres. Sherwin introducing EEI President McAfee

PCEA Tackles Basic Problems

A strong program combined with Coronado weather and smoothly functioning entertainment arrangements made the 41st annual convention of the Pacific Coast Electrical Assn. held at the Hotel del Coronado May 14-16 a rewarding and enjoyable experience. Attendance, which topped the thousand mark, represented a cross section of industry leadership in the Pacific Southwest and Hawaii.

The formal program, built around the theme "Living Up to Our Heritage," opened with a panel session which reviewed the association's activities and accomplishments (see p 73). John Kimball, vice-president and general manager of the Idaho Power Co. and president of the Northwest Electric Light & Power Assn., keynoted the program in his stirring address "Let's Close Ranks," an appeal to face up to the basic problem of standing up and being counted when our fundamental political beliefs and basic business philosophies are challenged (see p 79).

Reich—on Citizenship

Jack Reich, executive vice-president of the Indiana State Chamber of Commerce, urged the audience to take greater interest in grass roots political affairs. He pointed out that the political climate we see in Washington is created in the local communities and he cited the precinct captain as the key figure in the development of the political structure.

Reich challenged the audience by stating there were probably not more than half a dozen men present who knew their local precinct captain or who had ever taken the trouble to express their ideas and recommendations to him. He stated that it was far more important to inform the precinct captain of the type of laws that are needed than to run to Washington to try to put out legislative fires. He also condemned those who refused to take a public stand against fundamentally unsound proposals because of fear of economic reprisals. Much such legislation, according to Reich, stems from activities of militant minorities operating without much opposition from a complacent majority.

Burdell—on Education

New concepts in education were described by Dr. Edwin S. Burdell, president of the Cooper Union for the Advancement of Science and Art in New York City. One of the country's most prominent educators, Dr. Burdell predicted that tuition rates would have to be raised substantially to meet the mounting costs of education and he suggested that a great extension of student loan funds will be the method by which future students, particularly poor but gifted high school students, will be able to insure their future through the installment purchase of an education.

He also advocated the establishment of more junior or community colleges to relieve the pressure on residential colleges and to provide training for those students whose capacities might not warrant their beginning a full four- or five-year college effort. The speaker questioned the value of the so-called extracurricular activities as offering little to the student in the way of learning experience.

Of particular importance to the electrical industry was Dr. Burdell's prediction that corporations are going to have to take on more of the educational job in producing specialists. The continually broadened base of knowledge to be imparted at the college level will prohibit the continuation of "technician" courses, and the educational objective will be to turn out students with a sound training in fundamental scientific principles together with an appreciation of the arts and humanities.

O'Brien—on Electrical Manufacturing

The president of the National Electrical Manufacturers Assn., W. V. "Pat" O'Brien, who is also a vice-president of the General Electric Co., told the convention that the future we talk about "begins tomorrow"

Many visitors from east of the Rockies participated in the convention. In this group are Mr. and Mrs. Robert Cleaves (left), I-T-E Co., Philadelphia; Harold Elliott from Porcelain Products, West Virginia headquarters; with Mr. and Mrs. A. W. Jensen, Industrial Engineering & Equipment Corp., L.A.

PCEA President George Hawley receives a certificate of appreciation from President-elect Leslie Hicks of the Hawaiian Electric Co. at the concluding business session of the convention

and that we both as an industry and a generation have the obligation to pass on an even better business climate than we have inherited from the past. He pointed out that the past has been marked chiefly by a growing understanding of the social and economic responsibilities of business but that the rate of change of the past 50 years, fast as it has been, may appear to be slow in light of what is predicted for the next half century. In the space age, the rate of change makes it imperative that business think ahead and plan far ahead in order to obtain the proper perspective to carry on day-to-day operations.

O'Brien pointed out that the business of business is to stay in business and in this connection the vital concern is that of profitability. Thus the continuation of a business operation on a profitable basis is part of business responsibility to the shareowners, to the employees who have to look beyond next week's pay check, and to the community which bases much of its existence on the growth and prosperity of enterprises within its confines.

In being profit oriented, O'Brien stated that the industry must be people oriented because people will determine what happens in our industry in the coming years. There will be more people, more families moving to the suburbs, more disposable income and more competition for that income. People are going to live better—provided they are sold.

It is also a happy paradox that our industry will greatly benefit by the continual upward trend in the standard of living. This is because productivity will have to increase greatly to provide all of the things that the growing population needs. The needs and demands of the future population are growing faster than the labor force, which in turn will force increased automation and the increased use of electricity as a component of production. Research is also an essential part of planning for the future because from research will come the new products and new technologies that will improve productivity.

DuBridge—on the Stone Age

Intercontinental ballistic missiles are much more of a threat than satellites insofar as national security is concerned. This was the opinion of Dr. L. A. DuBridge, president of the California Institute of Technology, who addressed the opening luncheon of the convention. He pointed out that the exploration of outer space has tremendous scientific values but that satellites, as an offensive weapon, do not appear very practical.

While the theory of placing satellites in orbits has been known for at least two centuries, it has taken scientists and engineers that long to provide the mechanical means of developing man-made moons. Instrumented satellites are far more valuable scientifically than manned satellites and the former can be used to gain all of the vital information that will be necessary before it will be possible to successfully develop space travel in its true sense. Man's curiosity, according to the speaker, eventually will put him in outer space, but the timing and costs of such a venture will have to be carefully weighed in terms of value and prestige to the country.

Rindlaub—on Selling Women

Women are a very important segment of the customers of the electrical industry. Jean Rindlaub, vice-president of Batten, Barton, Durstine & Osborn of New York, outlined to the convention audience ways and means of getting favorable attention for our industry services, using appeals that have proven effective with feminine prospects. Women, she said, liked to be asked about what they want and need.

Mrs. John Q. Public likes attention, but above all she likes a consistently friendly approach in advertisements, letters, personal contacts and service. She likes new products and new ideas. She can be sold if the benefits of a product are translated into her own concepts. For example, an air conditioner doesn't cool a room — it's health insurance. Or a washing machine isn't a labor saver — it's a beauty treatment.

Women are not basically interested in political ideologies or abstract ideas, according to Mrs. Rindlaub. Rather, a woman is interested in learning how our industry, through friendly service, can make her life much healthier and happier. She's not interested in learning about kilowatts and adequate wiring as much as she wants to hear about how the industry can add to the fun of living in a house where there are plenty of outlets.

The speaker urged our industry to get ready for the coming boom. Boom in marriages, boom in new families, boom in babies, boom in housing and boom in jobs. While population alone will not keep the country flourishing, a growing population increases needs. Needs lead to

PCEA Directors Ed Buttner, Scott-Buttner Electric Co., Perry Yates, Bechtel Corp., and R. H. Gerdes, PG and E. Yates addressed the convention on policing construction costs

wants. Wants can be filled by productivity. Productivity can add up to prosperity. It takes confidence, ingenuity, strength and courage to do the job and the job can be done easier if business makes a strong effort to understand "mama."

McAfee—on Our Responsibilities

J. W. McAfee, president of the Union Electric Co. and president of the Edison Electric Institute, told the final convention luncheon that the current recession has spotlighted the importance of soundly financed and well-managed electric utility companies. Investors have shown a growing confidence in the stability of earnings that electric utility companies offer, and these earnings are an important prop to the economy in times of business downturn. Furthermore, the long-range construction program of the industry is not materially affected by temporary economic changes, and therefore the electric utility industry is one of the most important contributors to large investments in capital goods—another factor which tends to stabilize the national economy. These large construction investments provide jobs at a time when other elements tend to decrease such activities.

Our responsibilities, said McAfee, lie not only in continuing to operate for the best advantage of the national economy but likewise include the necessity of telling the public why and how investor-owned companies are carrying out these responsibilities.

Yates—on the Contractor's Obligations

In discussing the responsibilities of engineers and contractors to the utility business, J. Perry Yates, executive vice-president, Bechtel Corp., defined engineering-consulting firms as organizations of men representing a variety of technical and management capabilities who bring these skills to bear on behalf of the client. These men have the responsibility of designing for minimum total cost, using new and ingenious methods and "bare bone" construction concepts.

Turning from the design side of the business, Yates indicated that, on a typical construction job, the labor content was about 20% of the total price.

Much of this variation is the result of poor and abusive labor practices. Concerned over this productive loss, which was neither within the control of management nor had the sanction of top-level labor, a committee was set up to determine the facts. So impressive and shocking were the findings of the study group that union officials set forth the ten commandments of labor which pointedly condemned the abusive practices.

Yates said there are indications that these ground rules will be observed, and that union officials are willing to cooperate in setting their houses in order.

Summing up, Yates said: "Surely the application of our combined ideas and thinking on this subject must result in economies of design.

"In view of this, it seems to me not unreasonable to suggest that engineers and constructors might establish as a goal a 10% to 15% cost im-

Speakers made the program. From top to bottom: John Kimball, Idaho Power Co., and Jack Reich, Indiana State Chamber of Commerce; M. G. 'Mel" Kennedy, Ebasco Services, New York, with Convention Chairman Ralph J. Phillips, San Diego Gas & Electric Co.; W. V. "Pat" O'Brien, General Electric Co. ,and Dr. E. S. Burdell, Cooper Union, New York. Everybody got into the act when an impromptu jazz band was created during the banquet entertainment. Here is Graybar's Los Angeles Manager Sam Scott who "wowed" the audience on a French horn. Square D's Joe Pengilly, pictured on the cover, also participated

provement over the next five years in the sum total of their productive effort toward designing and building facilities for increased power generating capacity. This is an objective which I think we have an obligation and a responsibility to meet."

Young—on the Investor's Viewpoint

"Buyers of utility stocks are essentially a conservative group," Harold H. Young, vice-president, Eastman, Dillon, Union Securities & Co., pointed out. "They desire income and security."

Within the framework of conservative investing, however, they are interested in having their money work as hard as possible. They are constantly on the search, therefore, for companies making progress—the so-called "growth" companies.

On the subject of maintaining healthy relations with the investment community, Young recommended a program involving careful preparation of annual and quarterly reports.

Since the utility stock investor is not primarily interested in capital gains, his interest is focused on higher dividends as a means of hedging against inflation and providing a value return for his money. Young said that the investing public is particularly sensitive to the regulatory atmosphere in a utility service area. He pointed to the rapid growth of stock values in areas of progressive regulations, and further indicated that the sale of California securities in the future would very definitely be dependent upon the regulatory climate that existed at the moment.

Also of prime importance to the investment specialist was the feeling that the company management was well backed up with younger men who could move into key positions.

He summed it up in a sentence: "We like to see the earnings going up."

Kennedy—on Selling

Looking at our present-day economy, M. G. Kennedy, manager, sales, marketing and public relations department of Ebasco Services Inc., said: "To me, it's a very normal and healthy situation. It's the shock treatment needed to bring about a return to fundamental sales principles so frequently overlooked in times of boundless prosperity."

To lay the groundwork for his discussion, Kennedy traced the history of appliance sales as a load-building device.

Kennedy made the point that maintaining sales through the use of mass media seems to be applicable to a highly saturated market such as the automobile market, but is comparatively ineffective in building saturation.

"I wonder if we didn't get mousetrapped into the mass promotion approach by accepting without question the theory that it costs too much today to sell door to door. One leading vacuum cleaner manufacturer is certainly making a success of door-to-door selling—and at retail prices half again as high as most of his competitors. Mr. Fuller does all right door to door, too.

"These cases seem to prove the point that, in the prospect's own home, price becomes secondary. The housewife is buying social prestige, or economy, or comfort, or convenience—and she will pay whatever the salesman can convince her they are worth. In the prospect's home, the alert appliance salesman can sell service, he can handle financing, he can make trade-in offers and, at the same time, keep an eye out for the next sale. **It's the competitors who rely on price to bring buyers into their stores, not the customer, who set today's price levels.**

"May I suggest that you ask your sales departments for hard-hitting sales programs, appropriate the required sales dollars, and get set for a pleasant surprise."

H. H. Young (center), Eastman - Dillon, convention speaker on utility securities, draws the name for the prize in Electrical West's Kilowatt-Hour Rodeo from slips held by C. W. Leihy. Next year the prize will be $500 worth of stock of California Electric Power Co., San Bernardino. At the podium is C. A. Wikle, A. S. Schulman Electric Co., who presided over one convention session

de Hoffmann—on Atomic Research

Dr. Frederic de Hoffmann, vice-president, General Dynamics Corp., addressed the group on the subject of "A New Approach to Atomic Energy." Dr. de Hoffmann described the philosophy his company used in cross breeding theoretical physicists, mathematicians, engineers — all the scientific community — to pull together in short order any given scientific undertaking.

Dr. de Hoffman went on to point out the criteria General Atomic Division had established for future reactors, which were: (1) the system must be technically simple; (2) it must have a high thermal efficiency and low capital cost; (3) it must produce steam at steam conditions acceptable for modern turbogenerator equipments; (4) the system must be capable of long burn-ups—in the order of years; (5) the system must be nearly economical without reprocessing spent fuel.

Measuring the various reactor systems against this standard, General Atomic has concluded that a graphite moderated reactor with high temperature gas cooling best meets these stringent requirements. Such a system is in the advance stages.

Turning from the near to the far future, Dr. de Hoffman discussed the undertaking of his company in the field of controlled thermonuclear reactions. He told the group of the long-range $10,000,000 research program being financed by the Texas Atomic Energy Research Foundation. Commenting on the future of fusion power, he remarked: "True, fusion research today has little relation to our talk of immediate economical nuclear power, but the new approach to atomic energy requires that we be ready to look in all directions and that we understand and pioneer, step by step and system by system, in the years to come as we turn from research to development to prototype."

Hawaiian Executive Elected

L. A. Hicks, president of the Hawaiian Electric Co., was elected president of the Pacific Coast Electrical Assn. for the coming year. He succeeds George N. Hawley, vice-president of the Southern California Edison Co., under whose administration PCEA has continued to grow and develop as an essential industry organization. Two new directors were elected to the PCEA board: J. H. Mead of the Southern California Edison Co. and J. T. Isbell of A. B. Chance Co., San Francisco.

"Let's Close Ranks"

John Kimball

President
Northwest Electric Light & Power Assn.

NELPA President John Kimball speaking at the 41st annual convention of the PCEA

NELPA President John Kimball, viewing the need for unity in the electric utility industry, stated: "We honestly believe we're over the hump in Idaho. The plug has been dropped at Brownlee Dam and we are beginning to accumulate the waters which will ultimately create the power to serve the people in the area, beginning about Sept. 1.

"We want to thank the many Western people and companies that gave us help and assistance during our fight against the High Hell's Canyon government power advocates. It is reassuring to see the same kind of support for the Trinity issue. On these fundamental issues, the industry has closed ranks, which is our only hope for success against government power proponents.

"As we close ranks among ourselves, we should find that the distributors, the electrical manufacturers, the contractors, and dealers and other allies will form a strong phalanx against the political opportunists who are ever pressing for more government power.

"We can only hope for the support of the electrical community and the community as a whole if we pull together and help our potential allies to see that the freedom and independence of the electric utility industry will in large measure determine the freedom and independence of other segments of the industry and of our American economic system. Convinced that we are simply the most attractive target of our give-everything-to-government opponents, we must stand together again on such important issues as the Columbia River Development Corp., TVA bond issues, Trinity partnership preference and the trend in some REA quarters to become more than a rural agency."

Kimball turned to the subject of how to close ranks. "Boldness and courage are part of our heritage. The namby-pamby approach simply doesn't get anywhere with the majority of Americans.

"Drawing also on our heritage, we must use ingenuity and imagination. For with industry and imagination will come unheard-of technologies which can produce changes in our way of life undreamed of today. If we can couple this opportunity to change with a willingness to take a chance, there are truly no limits to our future as a people.

"Conversely, in the hands of government planners, there is seldom the courage or the willingness to take a chance. If anything is done to blunt the forces of imagination or the willingness to venture, the government will soon own our basic industries, opportunity will vanish and Socialism will reign supreme.

"We must operate more efficiently. We must hold our cost down and at the same time provide good quality service to our customers. To do this, we must use our ingenuity to develop new yardsticks to measure the efficiency of our operations as well as the quality of service we are providing to our customers. These yardsticks are not available in the standard accounting statements, and therefore it is incumbent upon us to find them.

"We are in a position of public trust, just like a bank. We must recognize that when we spend a dollar imprudently that dollar is being taken from a rate payer's pocket. We have an obligation to the rate payer. We must not fail him. We must serve willingly our fellow men, both as individuals and as companies. *We must recognize that our service is our ultimate offering to society.*

"Recognizing the obligations involved, I would like to make a prophesy. If we continue to run these companies in the future as we have in the past, keep our customers, employes, shareowners, and the public at large informed, we have the problem of governmental, socialistic encroachment in the electrical utility industry licked. The American people, in my humble opinion, are on our side but the government power politician hasn't found it out, yet. When he does he will know there aren't many votes for him in drum thumping for public power!"

NELPA President Kimball, Washington WP's Brunzell

Challenge to the NELPA Engineering and Operating Personnel, Safety and Purchasing Sections

"There is no better way, there is no better medium, for people whose day-to-day work is in a specialized area such as engineering, operation, purchasing, personnel, safety—or management—to exchange ideas. **As we attend the various section meetings and listen to outstanding speakers in and out of the field of our specialty, we will be helped to see the whole problem, and because we see and appreciate the whole problem, perform better in our own area of specialization."**

John Kimball

In words and pictures . . .

Quote—Unquote From NELPA Meeting

The Northwest Electric Light & Power Assn. Engineering & Operating convention in Yakima was a many-splendored meeting. Most of all, it represented an opportunity for people with common problems and different backgrounds to meet and, as is their wont, to discuss their business plans and problems. In this regard, we think first of the speakers on the program, the technical experts, the planners, the inspired leaders. But don't forget the bull sessions. Everywhere you turned, you saw men gathered in groups—the safety men, the communications men, the purchasers—talking about problems, the new ideas, the hopes and dreams of the business.

"...it couldn't have succeeded without everyone's help."

Brown

For another group, the convention represents the culmination of many months of hard work. These are the Dick Mortells, the Cecil Browns, the whole gang from PP&L's Yakima office who did such a yeoman's job at the convention. For them it's the day of the game after months of training.

In the sharing of ideas, the NELPA organization is particularly fortunate in being able to draw ideas from a leading utility organization from another country. Dr. Tom Ingledow, who is first vice-president of NELPA and senior representative of B. C. Electric Co., brings to the association the international engineering viewpoint. He and his colleagues from Canada have contributed fully to all phases of NELPA activities.

"Meetings like these provide a valuable forum for the sharing of knowledge."

Ingledow

The departure to direct quotations of a few individuals has its mixed blessings. First, it has the charm and spontaneity of reading an individual's words—unedited—exactly as they were spoken. The unhappy aspect of this approach is that many of the section meetings, indeed the general session speakers, Dr. Ward of Pacific Power & Light and Frank Cleary of Pacific Telephone & Telegraph, were not recorded and therefore not quoted here.

But much gets lost if you don't see it yourself. You can't record the steaks, the meetings of old friends—next year make it a point to be there.

"...it's a case of progress each year."

Mortell

Dick Mortell, Puget Sound Power & Light Co., with the cooperation of Dix Shevalier, Montana Power Co., carried this year's burden for the direction and organization of this meeting. Dick Mortell is a practical man. He is a relentless seeker of the better way. In directing the meeting, their aim was to bring capable people together to let them thrash out problems. They wanted everyone to feel free to ask questions—to stand up and speak his piece. These are Dick's thoughts:

> "These meetings represent special values for obtaining the ideas of your associates and neighboring companies, in bringing up problems that can be thrashed out in the group. One individual attacks the problem in one way, and another in another. When you hear the combined stories, you go away with an improved approach to the problem. It gives you an opportunity to try a third or fourth scheme that may have advantages over the others. Next year's meeting, you bring up new problems—it's a case of progress each year. **If the NELPA organization didn't exist, there would be no other medium of exchange of ideas. This is especially true regarding the design of hydraulic generating stations and the maintenance of this equipment.** This is true because there is no other place in the United States where there is such a concentration of hydrogenerating equipment. Our representatives to the various committees in NELPA are our source of contact in the event spare parts are needed or advice on how to tackle difficult maintenance or construction problems."

"...two years of college are taken in high school by European children."

Abetti

It would have been difficult in an off moment not to have been drawn to Dr. Pier Abetti, General Electric Co. Dr. Abetti, educated in European schools, has recently as a hobby translated a great many Russian documents to gain an understanding of the Russian educational system. It was easy then to drift from Dr. Abetti's topic of computers in power transformer design to ask for a first-hand appraisal of our educational system.

> **"We've got to consider that the average European child when he leaves high school has a background—a complete background—in science, economics, history and literature, and foreign languages—also very important.** So that he does not have to take these subjects in the first two years of college, as in this country. And, therefore, he can start at a much higher level. And in effect, many of the courses given in this country in the first two years of college are taken in high school by European children. Therefore, they start at least on a one-year higher level, and their college instruction can therefore be more effective in the scientific and engineering fields than experienced by students here. When they come out of college, usually their engineering training and science training is more advanced than in this country."

"...benefit of both the power company and the distributor."

Miksch

Much of the color, much of the fun at a convention is the result of the participation by sales personnel. The NELPA companies' purchasing representatives represent the values that sales engineers bring to utility companies. They bring them into the meeting and put them to work discussing common problems. This is valuable—farsighted. Here are Tom Miksch's, Pacific Power & Light Co., comments on this idea:

> "We have now promoted the idea of having meetings that would be attractive to sales personnel. We feel that they have often been the people most forgotten in a conference of this type. We have designed one session to interest the sales people and have them participate in the program. We think that there have been benefits gained from the interchange of information between the purchasing and sales, and we hope that it will continue in future sessions. In this particular

"Yakima"—that's Indian for hospitality

". . . include these pretty gals"— **McKee**

meeting, we chose the subject of "Distributors' Responsibility in Marketing." The subject was ably handled by a panel of three salesmen and one purchasing agent. We feel that we've had a very favorable reaction to the panel on the distributor's position in marketing and what he should do. **Various figures have been quoted, and we have analyzed those figures and will be able perhaps to cut costs or cut stock in our own warehouses and have the distributor do more stocking for us in quantities that we should select. By so doing, we would probably be working for the mutual benefit of both the power company and the distributor."**

Why do the Personnel representatives meet with Engineering and Operating groups? Here are thoughts of D. M. Pritchett, California-Pacific Utilities Co.

". . . If we're giving equal consideration to our investment in personnel."

Pritchett

"The Personnel and Safety people are happy to be meeting with the Engineering and Operating people. It appears to me to be a natural thing, because we are so closely tied in the operation of the company. If the Engineering and Operating people are going to get the end results, then we have a common objective in furnishing people to do their work. There again it involves training and development of people. I certainly feel that it is advantageous for our particular sections to meet with the O&E sections.

"When Dr. Ward told us about the Datatron installation in his particular company and the fact that $300,000 had been invested in that equipment, the thought struck me that I wonder if we're giving equal consideration to our investment in personnel to operate these intricate mechanical installations that we're making.

"It was also developed in our papers that this matter of fringe benefits and their cost is playing a more important part now in our labor negotiations than it has previously done. Early in our labor negotiations the matter seemed to revolve always around the wages, but the fringe thing has now taken on an entirely different aspect. It certainly is a part of the wage dollar, and we feel that the labor organizations are recognizing more now perhaps than ever before that they are desirous things to have, and are certainly all negotiable items."

On the safety side of the personnel function, there are some real working programs coming out of NELPA meetings—the kind of programs that will increase the safety of every operating company on a year-round basis. Here are the comments of Wayne Anderson, Idaho Power Co.:

". . . a well-planned job is both safe & efficient."

Anderson

"The primary thing that has been dealt with in the Safety Section is that of coordinating safety into the training programs, operational programs, educational programs – with the thought that a properly trained man on a well-planned job is both safe and efficient.

"Another thing that was gone into was how the group as a whole can function through NELPA and take better advantage of each other's experience. The plans have been made, and will be put into motion right after, to do such things as that any time a man in a company buys a film, after he's through showing it in his company, it will go into a NELPA film list and will be available to all the member companies.

"Another thing is accident slides. Each company, after having an accident, takes slides of the accident, investigates it very thoroughly, sends it to its people – and it is stimulating to point out that these have never been interchanged. And it is the group's desire that these be sent in and filed with NELPA. We will then be in a position to use another company's misfortune to prevent a similar hazard in our company."

The final luncheon meeting featured Pacific Power & Light's Paul McKee as principal speaker. In the midst of a moving talk, McKee struck a chord which may have really long-term impact for the E&O people in the meeting, as McKee pointed out that in industry at large, companies are insuring their future more and more with comprehensive research programs.

"The utility industry is not doing 10% of the research necessary to insure our future—either as an industry, or as individual companies. **LET'S PREACH RESEARCH!"**

This is perhaps a thought-provoking note worth closing on—to be continued next year.

Did Someone Say "Recession"?

Veryl Hoover
President
Rocky Mountain Electrical League

During a "Modern Laundry" campaign sponsored by the Rocky Mountain Electrical League early this year, some of our communities increased electric dryer sales 200 to 400% over 1957. This is a "recession"?

Creative selling—basing our sales efforts on the needs and desires of the consumers—and wonderful cooperation between manufacturers, distributors, dealers, contractors, engineers, architects and electric utilities are the two strongest forces behind the gratifying expansion of the Rocky Mountain electrical industry. If general economic conditions have had any influence at all it has been in the direction of improved sales efficiency and perhaps stimulation to build real impact into every cooperative sales effort. And always—this bears re-emphasis—sell the consumer what he wants at the time he is thinking about it. The schedule of our RMEL campaigns on this page illustrates how we time promotions to the seasons. It follows closely the Edison Electric Institute calendar.

We tell housewives about electric dryers when the weather is running the gamut from balmy days to blizzards. Modern kitchens are promoted when thoughts of spring housecleaning are beginning to stir. When the weather is stimulating thoughts about garden plots and picnics, we try to stimulate thoughts about the dishwashers that will save time that can be spent in the flower garden. Air conditioning is a natural for those weeks when Ol' Sol is beating down. Then comes our annual big-game season and the man of the house can be sold a freezer for his venison—and maybe a new electric range to cook it on. When the snow comes, what else but a TV set?

So, we present the things our customers want—when they want them—and assume that they will have or get the money to buy them. This year—the year of the so-called "recession"—is proving to us that they will.

Another important contributor to the general feeling of optimism in the Rocky Mountains is our close association with the atomic age. Remote regions in the Rockies contain some of the world's largest uranium deposits and the effects of this are felt everywhere. We are, in fact, an important part of the future. More obvious signs of the times that are encouraging are found in the electronics, missiles and research industries that are locating in several of our metropolitan centers. They are big customers, good customers and they, too, are tied to the future as well as the progressive present. And, as large as they are, their employees are making even more business for those of us in the electric industry.

We have still another reason for confidence. Let the industries come and bring their people with them—we will have the electrical energy they need. Within our region are great supplies of coal, petroleum, uranium and water. From the standpoints of both quantity and diversity, we are often tempted to call our region the "Energy Capitol of the Nation."

We'll be talking about many of these things at our RMEL annual fall convention Sept. 14-17 at Jackson Lake Lodge in Teton National Park. It is a beautiful setting, and the meeting will be alive with inspiration and plans for even faster progress than we are experiencing now. All of our industry friends are invited to be with us.

"Make Sales Great in '58 — Put Motion in Promotion"

Modern Laundry	Washers, dryers, combinations, ironers	February March
Modern Kitchen	Ranges, water heaters, disposers	March April
Dishwashers	Portable and built-ins	May
Air Conditioning	Window and central units	June July
Freezers—Ranges	Ranges, refrigerators, freezers	August September
Television	National Television Week	September October
Dryers—Electric Bedding	Dryers, electric blankets	October November
Operation Snowflake	All major appliances	November December

Head men of the Spring Conference in Denver (left to right): Co-chairman Ken Eaton, Anaconda Wire & Cable Co.; Don Spangenberg, Public Service Co. of Colorado, program chairman; and Dick Moody, Allis-Chalmers Mfg. Co., the other co-chairman

System operations, training and wiring promotions featured at . . .

1958 RMEL Spring Conference

An exceptionally well-rounded program, plus sparkling spring weather and a desire to get together to swap ideas and information, brought out a record crowd of almost 350 electrical industry people to the Rocky Mountain Electrical League's annual Spring Conference held at the Shirley-Savoy Hotel in Denver. Interesting and provocative parallel sessions together with the traditional Intermountain hospitality (courtesy of the electrical manufacturing group) combined to make the conference a highly successful occasion. The presentations by conference speakers proved to be a well-balanced fare that pictured some of the future developments for the industry, discussed current operating problems and outlined the objectives of an all-industry promotional effort which is being carried out in the area this year.

Engineering committee chairman, Lewis Gay of Allis-Chalmers Mfg. Co., with Prof. T. H. Evans of Colorado State University

Engineering Committee

The engineering committee, chairmanned by Lewis B. Gay of Allis-Chalmers Mfg. Co., presented a series of papers covering the areas of power production, system operation and engineering manpower training and utilization.

Three speakers described developments in the nuclear field. Ralph W. Deuster of Babcock & Wilcox described the general status and economics of atomic power with particular emphasis on the savings that may be in prospect from an improved fuel cycle. The fabrication costs of fuel elements together with the expense of handling and reprocessing used elements still is highly speculative due to the fact that it may be several years before actual work on spent elements will be done. There appears to be an appreciable economy possible as full-scale production of fuel elements gets underway and as better chemical processing and element fabrication techniques are discovered.

R. L. Witzke of Westinghouse Electric Corp. described the design features of the 134-mg pressurized water plant being built by the Yankee Atomic Electric Co. and Vaughn D. Nixon of General Electric Co. described the design and construction features of the 180-mg boiling water reactor being built by Commonwealth Edison Co.

Another interesting glimpse of future power plant design was presented by J. D. Andrew Jr. of Babcock & Wilcox Co., who described the "once-through" boiler. In this design, the water passes through the steam generator only once, being transformed from a fluid to superheated steam without passing through the conventional boiler drum. The design is essential for super-critical pressures above approximately 2,500 psi. The first such unit, a 4,550-psi, 1,150 F unit for the Philo station of American Gas & Electric Co., has given excellent performance. A cutaway section of this cyclone-fired unit is shown.

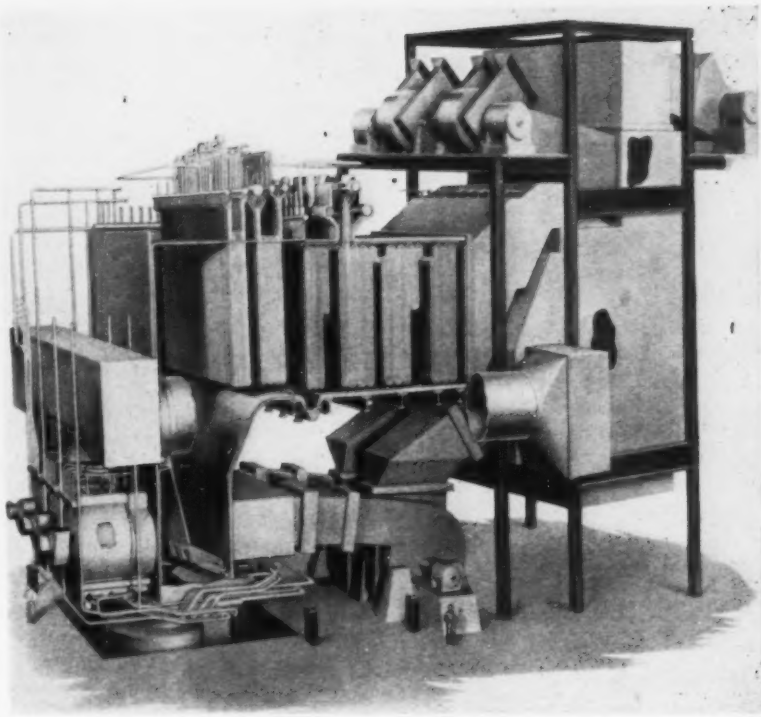
In the field of steam plant operation, two papers discussed the use and operating experience with cooling towers. Dr. P. D. Shroff of the Fluor Corp. described modern de-

signs and materials in the construction of cooling towers that minimize maintenance and C. J. Blasing, superintendent of electric production for the city of Colorado Springs, Department of Public Utilities, described operating experiences with cooling tower systems. From the experience gleaned at the latter installation, it was decided to use type II cement in the third unit as some spalling was experienced where concrete foundations were exposed to evaporation. Experience also dictated the use of an epon-resin paint for the protection of the internal cells of the cooling tower and the use of monel fan blades. Initially stainless steel fan blades were used in the installation and several cracks developed. It was found by drilling a hole at the end of the crack extension the defect could be halted.

Although fungus attacks have not been a particular problem in this installation, the latest cooling tower installation was made with creosoted lumber. The speaker also presented operating data pertaining to the relationship of fan load to turbine output—a problem that has individual solutions for each plant using cooling towers.

Homer G. Brines, results engineer at the Cherokee station of Public Service Co. of Colorado, described the control features that have been incorporated in that station, with particular reference to the interlock arrangement to improve safety and eliminate operating errors.

R. F. Price, chief electrical engineer of the power department of Stearns-Roger Mfg. Co. of Denver, used slides and a model to describe the step-by-step development of creating a substation. These involved the original choice of site for the station, the determination of the electrical requirements and type of bus arrangement necessary, the decision as to type of structure or structures, the actual engineering and drafting and, finally, the field construction operations.



Cutaway of the "once-through" boiler, designed for supercritical steam pressures

Leonard Bennett of Pacific Power & Light Co. described the legal problems involved in securing rights-of-way and property for utility construction.

A discussion of the methods of control of high-voltage motors in the 2,500- to 5,000-v class was presented by H. A. Wright of Allis-Chalmers Mfg. Co. While metal-clad switchgear is always used over 5 kv, there is an area below that where the combination of industrial control and properly coordinated fuses can be used with economy. The latter combination of contactors and fuses can be used up to motor sizes of 2,500 hp at 80% pf at 4,600 v. Limitations on interrupting capacity are 250,000 kva at 5 kv.

J. M. Wissenbach of Public Service Co. of Colorado outlined the use of automatic load control on that system and the methods of allocating load between plants for maximum efficiency. He also presented interesting cost data on various types of communication such as systems for voice, supervisory, load control and other systems. His paper will be published in a forthcoming issue of Electrical West.

Experience on the Southern Colorado Power Co. system in connection with the staged fault testing of transmission lines was reported by George D. Perry Jr. of that company. He stated that staged fault tests are necessary to check the performance

Power plant experts (left to right): Homer G. Brines of the Public Service Co. of Colorado; Stewart C. Porter of Stearns-Roger; and J. D. Andrew of Babcock & Wilcox

Harrison Davin of Bussman Mfg. Co. demonstrates the fundamentals of the protection of electrical equipment for the meeting

Committee heads: C. A. Stoakes (left), Public Service Co. of Colorado and chairman of the adequate wiring committee, with C. M. Melby, also of Public Service, who chairmanned the accounting committee

Above: P. J. Kronenberger Jr. of Colorado Central Power (right), information committee chairman, with one of his speakers on public relations, Jack H. Reed, PS of Colo. Below: S. W. Huntsman, PS of Colorado and chairman of the sales and promotion section, talks with Spangenberg

of transmission line relaying and that whenever possible oscillographs should be used to record the results. As a result of this testing program, the system is standardizing on overcurrent-type ground carrier and ground back-up relays instead of the product type. Faults were generally staged by closing the line in against a bolted simulated fault at the far end of the circuit.

Two speakers discussed the engineering manpower situation. T. H. Evans, dean of engineering at Colorado State University, described the current trend in developing engineering curricula that will meet the broad needs of industry generally. He indicated that there is a trend toward less specialization at the undergraduate level in favor of teaching basic fundamentals of science and technology. This, in turn, left more of the specialized training up to industry after the young engineer takes a job. Dean Evans also indicated that opportunity for young people who do not have the aptitude for the present engineering college programs is the technical institute training offered in a number of schools throughout the country with the objective of turning out technicians who can carry out many sub or semiprofessional tasks.

More effective utilization of the industry's engineering manpower was discussed by C. W. Leihy, publisher of ELECTRICAL WEST. As a corollary to Dean Evans' talk he pointed out that the areas where the utilities are weakest in handling engineering manpower appear to be in the matter of providing more technical assistance to keep engineers from doing routine jobs and he suggested that on-the-job professional development such as job rotation programs, company classes and additional postgraduate studies could be better organized within most utility companies. Management, he said, should provide time for engineers to maintain cordial relations with nearby engineering institutions, to attend technical societies and conventions and to meet in orientation classes and brainstorming sessions that would lend their abilities to formation of company policy.

Accounting Committee

Under the chairmanship of C. M. Melby of Public Service Co. of Colorado, the accounting committee covered a variety of subjects in its program as well as trying out a new technique of presentation. The latter consisted of two skits depicting how not to impress and influence customers. The latter were introduced by Harold Rust of Colorado Central Power Co. and the audience was asked to participate by listing the number of errors they could detect in the way customer relations problems were handled. An electric fry pan was given as the prize to the most observing spectator. Other speakers also discussed the matter of employee and customer relations. O. P. Reed of Public Service Co. of Colorado told about the need for better communications within the company as a means of keeping employees satisfied and enthusiastic. He emphasized the need for careful selection of employees and for training at the supervisory level. Donald Finnie of the Mountain States Telephone Co. demonstrated proper telephone techniques for customer contact employees.

Two speakers from the commuter field described applications of electronic equipment for public utility use. S. J. Fitzpatrick of the International Business Machines Corp., San Francisco, and Harold L. Moore of the Burroughs Corp. of Denver outlined the wide scope of application for electronic data processing systems in utility operations, both in the engineering and accounting areas.

Two other speakers gave details of accounting procedures. L. V. Hunt of Public Service Co. of Colorado told how his company operates pay roll accounting on an exception basis. As a starting point, everybody is paid for 80 hours at the regular rate each two weeks. There are five exceptions or deviations from this standard, which include the necessary record of lost time and providing for individuals who do not work standard shifts; individuals that work at other than regular rates; corrections for various types of work; and the exceptions for overtime or miscellaneous pay comes into the picture. He then went on to describe the procedures by which these exceptions are carried into the accounting procedure of the company.

Methods of simplifying the handling of repeating requisitions were outlined by O. H. Aydelotte of Public Service Co. of Colorado, who listed ten points that simplify procedure, fix the responsibility for reorder and keep the storekeepers informed of system requirements. He presented forms that his company has developed for streamlining procedures of purchasing units that are used repeatedly and regularly in the course of system construction or operation.

The information committee (P. J. Kronenberger Jr., Colorado Central

Power Co., chairman), the adequate wiring committee (C. A. Stoakes, Public Service Co. of Colorado, chairman) and the sales and promotion section (S. W. Huntsman, Public Service Co. of Colorado, chairman) met jointly and in parallel sessions with the objective of putting a push behind the national and local promotional programs that will be carried out by the league this year. Included in the presentation were talks by prominent Denver area newspaper, radio and TV executives who told how the various media could be used effectively. Lloyd Clements, supervisor of Denver's Electric Institute, urged for intra-industry coordination to get maximum effort behind promotional ideas. Heavy emphasis was placed on the need to push the Housepower program and to get an all-industry effort behind the sale of adequate wiring.

Farm electrification problems and the promotional calendar of the Colorado Farm Power Council likewise received a prominent place in the program.

Employee Training

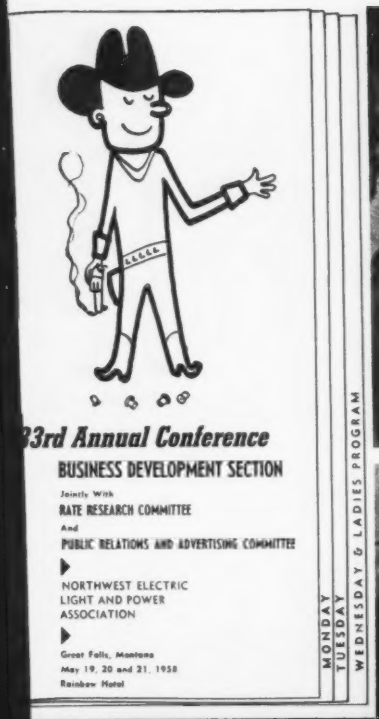
Training of the employees who are in contact with the public assumes an important role in successful promotional activities, according to E. H. "Dick" Pemberton of Southern Colorado Power Co. He pointed out that business and American industry must not only provide the material needs of the population but also must fulfill its social obligations which involve the people's desires for economic security, recognition and self-assertion. He pointed out that misunderstandings, particularly in the utility business, cannot be overcome by the printed word but must be corrected by a fully informed and understanding employee organization that can interpret business objectives and company objectives to the general public. One suggested way of doing this is not only to have strong employee education programs but the encouragement of the employees to spread out in the communities and take part in the civic life. An extension of these talks was provided by Jack H. Reed of Public Service Co. of Colorado who discussed "The Employee and Public Relations."

The Spring Conference concluded with the annual banquet and dance at which over 20 retired members of the industry who had been active in league affairs were recognized with appropriate certificates and spent the evening as guests of the group.

RMEL Vice-president J. E. Wilson (center), Colorado Central Power Co., with two conference chairmen, Robert Irion (left), hotel arrangements, Thorle Vieau, sociability

Left to right: Speaker George Perry, Southern Colorado Power Co.; W. L. Kelley, General Electric Co.; and Speaker Leonard Bennett of the Pacific Power & Light Co.

This is not the way to do it—a skit put on during the conference by the information committee showing errors of omission and commission in handling public contacts



Montana hospitality began at the door of the Rainbow Hotel. Led by Sheriff L. D. Regan (in black stetson), these boys* were mighty quick with their guns—also mighty good hombres with projectors, microphones and dozens of details that make a meeting run smoothly. Sam Chase, left, Montana Power vice-president and counsel, welcomed the visitors; brought greetings from President Corette. Here he shares a joke with Co-chairman H. K. Dickinson, Great Falls division manager

Dee McGonigle, right, Montana Power sales manager and co-chairman for the meeting, confers with NELPA's executive manager, Al Krieg, and Jeane Faulkner, association secretary

"Think Big . . .

Coordination of sales promotion activities by all branches of the electrical industry on an area basis is a must for survival in the years of hard sell. This was stated at the opening session of the Northwest Electric Light & Power Assn.'s Business Development Conference in Great Falls, May 19. It was discussed in section meetings and concrete suggestions for taking it out of the talking stage were given by a panel representing the trade associations on the final day, May 21.

More than 200 attended the meeting to take part in the program set up by Section Chairman Otto Zwanzig, BC electric, with bureau chairmen and the local arrangements committee, around the theme "Think Big . . . Plan Better."

Coming my way? asked bureau chairmen in a brief "hard sell' effort that preceded the parallel sessions. Having heard some of the reasons for industry coordination at the opening general session, delegates went into group meetings for shirt-sleeve discussion on implementing the program. The hard-working chairmen are from left: Darcie White, UP&L, Electric Home; George Challenger, BCE, Rural and Farm; Fred Groch, PGE, Rate (substituting for J. A. Polson, BCE); Arno Gish, PP&L, Commercial and Industrial; Fritz Cochrane, Idaho Power, Public Relations and Advertising (substituting for G. L. Stanton)

Section Chairman Otto Zwanzig, center, BC Electric, looks over the program with opening session speakers, Miner Baker, Seattle banker, left, and George Brunzell, WWP, NELPA vice-president

Achieving—not merely talking—coordinated sales effort was discussed by a panel representing all branches of the industry. Moderator Frank Reis, PP&L, directs a question to A. W. Bernsohn of NARDA, far left. The other experts are: T. F. Preston, NAED, John Biggi, NEMA, Frank G. Werden, NECA

Questions from the floor were sorted to avoid duplication. Here Moderator Reis discusses one with the committee, from left: Art Bell, Hotpoint, Chicago, Joe Platt, Joseph C. Platt Co., John Lawton, Graybar, both Seattle, Lea Phillips, PP&L

In years of hard sell industry coordination is essential, say NELPA speakers. Therefore the industry must . . .

Plan Better"

NELPA members took an honest look at their problems, listened to experts from the several segments of the industry and brought in outsiders for an objective appraisal. They learned how they could help the other fellow and what they could expect from him. They also found out some of the things they could *not* expect since, as one speaker put it, coordination must be accomplished within the framework of enlightened self interest.

Defining the problem, Zwanzig said there was need for internal coordination to bring combined resources to bear as effectively as possible on the task at hand and for acceptance of a comprehensive marketing concept that will sell the public and keep it sold.

In a keynote address, "Together We Sell," George Brunzell, executive vice-president of Washington Water Power and vice-president of NELPA, pointed to the utility industry's contribution through the years to appliance promotion; indicated that the day has come when it cannot go it alone.

"We have every intention of continuing an aggressive sales program," he said, "but in the future we must work as part of a team." It is important to sell electricity but even more important to sell it profit-

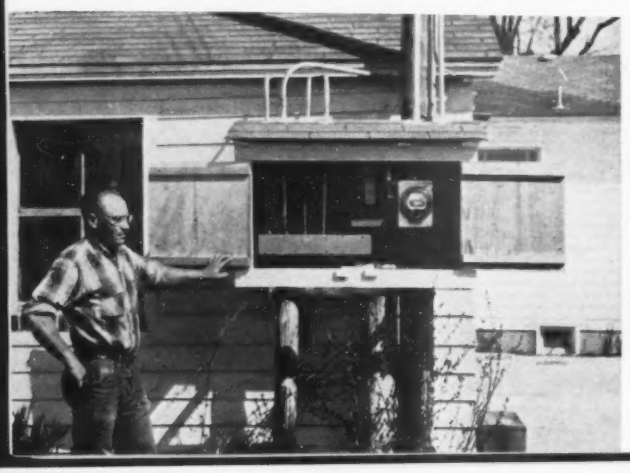
*Sheriff's men (top opposite page); Malcolm Marshall, Bill Marnin, Deane Long, all of Montana Power's Great Falls Division; Al Leader, Anaconda, Seattle; H. R. Ellerby, G-E Supply, Butte; Jack Lindsay and Bill Jones, Montana Power

There was time for fellowship and recreation after the business sessions. Montana partners were luncheon hosts in a beautiful setting at the power company's Ryan plant. After a look at the spectacular falls delegates picnicked on fried chicken, then were given a tour along the Missouri past the new Cochrane Dam site, the Rainbow plant and ending with an inspection of Anaconda's wire mill. The ladies joined in this outing and at the First and Last Chance Watering Holes provided by the manufacturers and distributors. In addition a special ladies program was arranged by Mrs. H. K. Dickinson and Mrs. L. D. Regan

Electric Home Bureau reported successful promotion drives; told of activity surrounding the Medallion program. Here Evelyn Hansen, left, explains her flannel board demonstration to Chairman White and B. W. J. Smith of BCE. Construction

picture at right shows first four of six Bronze Medallion Homes under construction in Boise's growing suburban area, described by R. J. O'Conner, Idaho Power. Similar progress reports were made by W. A. Lowry, WWP, and by W. L. Tait, PGE

Shown at Wednesday's luncheon session was a movie of Riverland Irrigated Farms, near Lillooet, B.C., where BC Electric is demonstrating what irrigation powered by electricity can do for dry belts. Eventually Riverland's 400 arable acres will support 1,500 head of cattle. Members of the Rural and Farm Bureau also heard how to promote better farm wiring. One of the speakers on this panel described the service pole mounted distribution system (below) being encouraged by Idaho Power



ably, he declared. "We must gauge the result of our own sales effort by the contribution it makes to net income and not just to gross."

First of all the utilities themselves must coordinate their programs, Brunzell believes, offering the same assistance, promotional aids, subsidies to their allies and asking for the same amount of cooperation in return. He suggested that public relations programs be coordinated also for maximum results.

Problems facing utility allies and aids available from the trade associations were brought out by the panel of nationally known speakers on Wednesday morning. Panel members were A. W. Bernsohn of Chicago, executive vice-president, NARDA; Frank G. Werden, St. Paul, field representative, NECA; John Biggi, manager of the business development department, NEMA, and T. F. Preston, secretary of field activities, NAED, both of New York. Frank Reis, PP&L, was moderator. Here are a few of the points emphasized:

Bring everybody in at the planning stage. Play it a little farther from the vest, so the allies can really complement each other.

Manufacturers should not be expected to pick up all or part of the tab on a promotion handed to them full blown. They will not drop a national program in favor of a local promotion; therefore timing is important. Big national houses must avoid charges of favoring one locality over another and requests for aid should be made with this in mind.

The distributor should be recognized as a catalyst on the local level. He can sound out potential customers, act as emissary between industry branches. He is capable of creating ideas as well as carrying them out.

Dealers too should be given a bigger voice in planning and they should have a few chips on the table. Don't hand even the small dealer anything on a silver platter. But don't always make it a load-building program; sometimes push an appliance that is a money maker for dealers.

The contractor is an independent business man with all the inherent problems. Don't assume that he is dragging his feet on industry promotions; maybe it is some other member of the team. The industry should not underestimate its need of the contractor for resi-

Scheduled for completion in November 1958 is Western Copper Mills plant on Annacis Island, B. C. This is just one of the developments encouraged by BC Electric through Western Development and Power Ltd., whose activities were outlined for the Commercial and Industrial Bureau by J. C. Ingram (center in group picture.) Others are William F. Rooney (left) Ebasco's Northwestern manager, and Frank L. Fairfield, AIREFCO manager, both speakers on the well-planned bureau program

dential modernization and for the total interdependence picture. It should not create an atmosphere that forces or encourages him to sell on price alone. The industry's objective is to upgrade. In his forthright talk, Werden made a strong bid for construction by contract; asked utilities to give it a trial.

The Outside Viewpoint

Looking toward the future of the Northwest, Miner Baker, vice-president of the Seattle First National Bank, asked "if the resource-based industries and aircraft will not quite support the growth we need, can we in fact do anything about it?" He thinks so because of two types of opportunities that can be improved by intelligent local effort: market based industries and so-called footloose industry.

He commended utilities for their interest in industrial development despite problems of keeping up with load growth; said he believes it to be an entirely logical function of the industry to "work at creating a larger load while you worry how to meet it."

Applying national projections to the states of Oregon, Washington and Idaho, the area may expect an increase from 46 billion kwh last year to from 112-136 billion in 1975, he said.

The industry can give its advertising dollar a lot longer ride by watching the changes in the customer's way of life and weighing them against shifting patterns in media, Wendell Ashton, vice-president of Gillham Advertising Agency, Salt Lake City, told the conference. He cited the mass to class movement in buying; increasing number of working wives; fact that the U. S. has become a musical nation within the recent memory of most of us.

He said that his company is steering away from medium-size newspaper ads in favor of big space that cannot be ignored or small ads that stand a good chance of landing in top position.

The Academy of Lighting Arts training program was described by Thomas Parsons, San Francisco, G-E residential market development specialist. G-E has spent $500,000 on this residential lighting promotion and expects to put in $200,000 more, he said.

Electric Home Bureau

This group made a careful study of dealer participation through electric leagues, hearing from the Inland Empire league through Bill Lowry, WWP, and from the Intermountain association through D. L. Holt, Utah P&L. It also heard A. W. Bernsohn of NARDA and John Biggi of NEMA, present for the general session panel.

A highlight of the program was the presentation by Evelyn Hansen, Utah P&L, proving that "one picture is worth a thousand words." Miss Hansen showed three of her demonstrations, including one that got the audience in the act to prove that 625 steps are required to hang out an 8-lb washing without a dryer; three steps with a dryer.

Commercial and Industrial Bureau

The utility's place in community development had an important place on this parallel program. W. F. Rooney, Ebasco Services, pointed to advantages in the higher standard of living as well as in new industries and to the intangible benefits to free enterprise. J. C. Ingram, director of industrial development for BC Electric, told of the work of Western Development & Power Ltd., formed in 1956 to develop power resources and foster industrial development.

This group also took a look at the heat pump with Frank Fairfield, AIREFCO, who reported that this equipment has grown up. It sized up progress in electric cooking and found it good. It heard of the sales opportunities in modernization under the "Mobilize for Prosperity" program described by D. E. Kampschror, Westinghouse manager at Butte.

Rural and Farm Bureau

How the electrical industry can best meet the challenge in the changing farm enterprise was discussed by a panel including William H. Knight, WSC, agricultural engineer; Donald Bosley, feature editor, Montana Farmer-Stockman; Andrew H. Schmidt, Copco.

NELPA's Rate Research Committee working long and hard. Their parallel meeting was informal group discussion, no holds barred

Trends in the dairy equipment field with particular attention to the use of bulk milk tanks were told by Merritt Nash, secretary-manager, Washington Milk Producers, Seattle.

Tuesday morning, the group heard a panel on farm wiring promotion, including Don Jordin, WWP, E. E. Haroldsen, Idaho Power, T. Adamson, Montana Power. Applications of electric heat to farm operations were told by L. N. Roberson, president L. N. Roberson Inc., Seattle. Frank G. Machaness, PGE, reported on his company's program to develop irrigation load.

Rate Research

Rate simplification as a tool for prevention of undue discrimination between customers is to be preferred to special customer classification, but it is not an end in itself, it was brought out by the Rate Research Committee. Even the most desired simplification must consider the present status of customers and the effect of the proposed change on each one.

Special rate problems included the consideration of minimum bills for large industrial customers to protect utility investment in service facilities. It was concluded that trailer court bills should be the responsibility of the court operator and that street lighting rates often do not provide an adequate return on investment, especially when the utility owns the lighting fixtures.

The average cost of electricity to industry is 0.8% of the value of the product for the nation as a whole. Of the 448 industries listed by the U. S. Census of Manufacturers, cost is a determining factor in the location of only four: aluminum reduction, alkalies and chlorine, other inorganic chemicals and compressed and liquified gases.

Electric house heating is actively promoted by one of the companies represented. Two others have rates low enough to encourage heating load growth without promotion; the remaining four have little heating growth.

Public Relations and Advertising

How a concentrated effort such as Montana Power's current Electrical Tuesday promotion can stretch the advertising dollar was told by Owen Grinde, advertising manager. Set up to sell the quality and value of electrical services as opposed to the price-cutting tactics that exist in many places, the program is getting excellent dealer response, it was reported.

Participating campaigns have been set up by Washington Water Power as a means of meeting the "recession" market. The company program, described in a paper by Gordon DeFoe, general sales supervisor, is designed to encourage dealer tie-in ads, create immediate store traffic and get active distributor support in manpower and money.

"Let's keep our advertising messages simple," urged Fred Kempe, PGE public relations and advertising director. He believes that many ads do not get across because they tire people. His company is building its public relations story around its recreational facilities and is carrying the same thinking into sales promotion, taking small space for brief messages.

John Dierdorff, PP&L vice-president, reported that testimonial type advertising has been found effective in showing benefits of a high use of electricity.

An effective program in which each utility employee does a planned job of public relations was described by Harold Anderson, publications editor, Washington Water Power.

Top flight speakers were on the Public Relations and Advertising Committee's program, called one of the best by those attending. Conferring here are John Dierdorff, PP&L vice-president; R. Harold Anderson, WWP (standing), next year's chairman; Acting Chairman Fritz Cochrane, Idaho Power; Will Bowman, Utah Power & Light PR director and vice-chairman elect

From the left are: Gus Norwood, executive secretary of the Northwest Public Power Assn.; Alex Radin, general manager, American Public Power Assn.; Glenn Walkley, president, Washington State PUD Assn.; John George, president, National Rural Electric Cooperative Assn.; P. C. Spowart, president, NWPPA; and Owen Hurd, president, APPA. About 240 members attended

NWPPA talks about . . .

More Power for More Jobs

Guided by a meeting theme of "More Power for More Jobs," some 240 members of the Northwest Public Power Assn. discussed various means of stimulating the economic growth of the Pacific Northwest at a three-day meeting in Spokane, April 16-18.

President P. C. Spowart, in his keynote address, used the Employment Act of 1946 as the foundation for urging NWPPA members to be united in efforts to get more federal government investment in forestry, hydroelectric and soil conservation projects.

"All of us agree that we have many things that need doing. One of our most important jobs is to develop our natural resources and put them to use," Spowart said.

"In the face of this need, we have over 5,000,000 unemployed (nationally). We could have work for all. We are wasting both our human resources and our natural resources. By good planning, by establishing the proper procedures, by establishing the proper governmental machinery, we could insure that these wasted human resources and these undeveloped natural resources would be brought together. As a result we would have a stronger, happier, and healthier nation."

Pointing to the specific economic development needs of the Pacific Northwest, John D. Abrahamson of the U. S. Department of Commerce said the lack of industrial diversity and of nonresource-based industry in the Pacific Northwest is impressive. "An organized effort at community development has lagged here in the Northwest," he said.

Abrahamson advised establishing organizations to lead local efforts to gain new industries. He recommended seeking nonresource-based facilities because they are less responsive to minor fluctuations in the national economy. An example presented by Abrahamson was the electronics industry, which is noted for its absence in the Pacific Northwest.

A subject of much interest at the meeting was the new demand-energy rate, tentatively called E-5, being designed by Bonneville Power Administration to relieve a revenue shortage. Dealing with this subject were Eric C. Brundage, power analyst, Seattle City Light, Robert B. Gallup, R. W. Beck & Associates, and Elmer W. Moke. They discussed the merits of substituting a demand-energy rate for the present kilowatt-year rate, the effect of the new rate in facilitating nonfederal generation and also the flexibility of the new universal rate design.

In effect, the new universal rate would give BPA a rate increase that it is after, billing would be simplified, it would tend to allow more use of excess machine capacity in the government hydro plants. The E-5 rate would eliminate various rates presently being used. Not the least of the problems involved in designing it is to achieve a universal rate that will not have major effects on individual buyers.

BPA is aiming for an increase of not less than 3.8%, but further study may reveal that even more is required.

Herbert Lundy, editorial page editor of the Portland *Oregonian*, talked on the subject of regional power responsibility. The *Oregonian* supports the organization of a regional corporation for the purpose of taking over federal projects and assuming over-all responsibilities for coordinating planning for the power future of the Columbia Basin.

The NWPPA has sponsored the Columbia River Development Corp. bill which has been introduced in Congress as a means of speeding up regional power development. Purpose is to make up a deficit between generation and demand. "I do not endorse all provisions of the bill as drafted by your organization," Lundy said. He suggested, as an example, that the preference provisions should be removed in order to gain marginal support for the bill.

"How can you justify them (preference provisions) if, as you say, it is certain the corporation will make up any potential power deficit?"

New NWPPA officers elected at the meeting are: Vincent M. Cleaveland, manager, Clark County PUD, president; Ivan Laird, director, Coos-Curry Electric Co-op of Coquille, Ore., vice-president; and Ed Cooney, chairman, Board of Commissioners, Cowlitz County PUD, treasurer.

Willard C. Brown of G-E Lamp Division

At three regional conferences

IES Learns Latest

Three regional conferences of the Illuminating Engineering Society were held in Western states in May—Intermountain at Pueblo, May 8-9; South Pacific Coast at San Diego, May 12-13; Pacific Northwest at Portland, May 22-23. All three were addressed by national figures whose talks are briefed here: IES President Kirk Reid, General Electric Lamp Division, Cleveland; C. L. Crouch, IES technical director, New York; W. H. Kahler, Westinghouse Lighting Division, Cleveland; Willard C. Brown, G-E Lamp Division, Cleveland; Mr. and Mrs. W. P. Lowell Jr., Sylvania Electric Products, Salem, Mass.; J. H. McCulloch, Independent Testing Laboratories, Boulder, Colo.

President's Report

Kirk M. Reid

Answering ten questions that might be asked about IES, President Reid condensed effectively the scope as well as the purpose of the society. Even its purpose was "translated" understandingly, "to learn more and more about lighting and tell more people what we know." Who belongs? 9,000 members, 1,000 of them in Canada, some in Mexico and throughout the world but chiefly the U.S.A. It has 81 sections or chapters, the 81st, Yosemite Chapter at Fresno, he was about to charter on this trip.

As to its technical stature, he differentiated between the society and a trade association, and described its fellow and full-member grades as equivalent to the Ph.D. and Master's degree in lighting. Its technical activities through 70 committees and subcommittees, its research institute contracting with universities for basic research, qualify it as a technical society. Encouragement of students to have greater interest in lighting at the high school and college level, provision of student membership and allied arts competitions seek to extend the society into the future.

He concluded by listing a number of activities IES performs in cooperation with other organizations and societies, its standards of recommended practice, printed proceedings and other publications. He announced a new edition of the IES handbook in January of 1959 with a complete rewrite of the sections dealing with quality and quantity based upon new findings by Dr. Blackwell.

Plastics in Lighting

W. H. Kahler

In an endeavor to bring better understanding to a controversial subject, that of what plastics are suitable for use in lighting equipment, Kahler said the major problem was not to be found in the materials themselves but in a lack of understanding of their use and application, their limitations as well as advantages. Light weight, ease of handling, low cost and other qualities were given as reasons for using them. Lack of standardization of these products, however, has made engineering of them with any accuracy a difficult thing. Standards are now being developed. He differentiated between the thermosetting and thermoplastic materials and then described the original classes, acrylic, polystyrene, vinyl and polyethylene. In general, the acrylic stands up better under outdoor use or where subjected to strong ultraviolet light. The polystyrenes are fairly brittle but lighter in weight and much more versatile in application and light transmission, although subject to discoloration. The vinyls have to be made in very thin sections to get light transmission but are lower in cost. The polyethylenes are applicable with higher temperatures.

Results of Research

C. L. Crouch

A year ago, Crouch said, he was told that the field was outrunning the society on illumination levels and that its recommended standards were so far behind current practice that they could not be used. Now he came with the results of accelerated research on the part of Dr. Blackwell and his research organization. What they found out as necessary levels for doing various eye tasks went far beyond anything anticipated by IES committees. Lighting levels from two to three times higher than today's were indicated as just normal. (Full report of the Blackwell studies will be published in *Illuminating Engineering* soon.)

Just a few indications of what these levels are were given by

Speakers Hugh McCulloch, W. H. Kahler and J. Sam Hamel at San Diego meeting

in Light

Crouch. For pencil writing on school paper 70 f-c was found needed. This has caused the school people to re-examine all of their tasks and submit them for a recheck. For a secretary to read her penciled shorthand notes requires 76 f-c. Easy reading of a fifth carbon copy of a letter, 133 f-c. To see the white lines of a blueprint through a tracing paper requires 120 f-c. Other examples were likewise given of industrial seeing tasks requiring many times the present amount of light.

He mentioned studies being made by Prof. Dan Finch at the University of California on the specular reflection both from paper and pencil graphite, which still further cuts down its visibility. Lighting levels needed in the home range from 70 f-c at the sink to 200 for sewing with dark thread on dark material. Office tasks require 10 times present recommended levels. The new edition IES handbook due January 1959 will contain these new levels and the various committees on recommended standards are studying their application to their particular fields.

High Output Lamps

Willard C. Brown

Search of the lamp companies to develop means for getting much more lumen output or light from fluorescent lamps in order to light large areas from higher mountings or with less fixtures was described. Brown listed the factors the lamp makers had to consider, such as the length of the lamp, its size, the filling gas, the mercury pressure, the shape of the tubing and the design of the terminals. In doing this he showed the potential improvements as well as the deterents from various aspects. In some cases life or maintenance was sacrificed to get high output. In other cases mechanical difficulties, such as lack of strength of the tubing if its shape was changed to oval, caused the study to seek other directions. Finally, by indenting grooves his company has achieved a cooler type of lamp which has 15 points at which greater efficiency is attained with a 5,000-hour lamp life and high lumen maintenance. How its use even with new ballasts and fixtures balances off economically was likewise shown. Then he described many applications to outdoor street lighting if enclosed, high-mounting, high applications in industrial plants and even office and commercial installations where special fixture designs shielded its higher brightnesses. Constant research and study, he ended, are developing more light in the package and the physicists and scientists are still seeking more.

W. P. Lowell, standing beside IES President Reid and Carlton Thompson

Behind Iron Curtain

Mr. and Mrs. W. P. Lowell Jr.

Of more human interest than lighting interest was the discussion of their experiences in Russia attending an international technical conference last year by both Mr. and Mrs. Lowell. Their lighting observations had already been published in *Illuminating Engineering* last year and they showed only one or two pictures of street lighting applications. The remainder of their talk was to describe how well they were treated at the beginning of their journey, only to be insulted in the last 10 minutes as they boarded the plane to leave the country. Their comments regarding the importance placed upon technical education by the Russians, illustrated by spectacular pictures of the massive university, gave emphasis to the need in this country for acceleration of technical education.

Lighting Progress

Hugh McCulloch

As chairman of the IES lighting progress committee, McCulloch explained its purpose and invited submission by all members of more new applications and equipment from the West. With slides, he then gave a condensed version of the report as he had given at the national technical conference last year without the aid of some of his properties, notably the motorcycle, the Phineas Phog costume and the sparkling illuminated bathing girl. His report also was published in last year's IE. He did show a massive street lighting fixture for use with mercury lamps shaped somewhat like a huge half moon.

IES Technical Director Cash Crouch

L. A. Johnson, So. Colo. Chapter — A. E. Fleming, Regional Vice-president

J. A. Setter, G-E, Denver — Eugene Pauly, G-E, Danville

Dr. Al Sutton, Pueblo Optometrist — C. L. Crouch, IES Technetrist

. . at Pueblo—

Lighting at the U. S. Air Force Academy under construction at Colorado Springs was a keen disappointment to Kirk Reid, president of the IES. "The lighting will be obsolete by the standards that will prevail at the time the academy is completed," he said after a tour of the academy with the 79 delegates who saw the academy as a part of its second technical session of the Intermountain Region at Pueblo May 8-9.

"One impression I got, right or wrong," Reid said, "is that the lighting does not match the construction, which is very forward looking. They have not used the new lighting materials that are available.

At the next day's technical session in Pueblo, Bernard A. Hemelt, chief of the electrical branch of the Air Force Academy construction agency, described the lighting systems. He said the lighting installation can be improved in the future, as he described its details (to be covered in a later story). "The circuits, conduits and panels installed are loaded only 50%," Hemelt said.

Discussions during a featured session on ballasts for fluorescent lamps indicated the design and production of ballasts are not keeping abreast of lamp developments. W. P. Lowell, Sylvania Electric Products, a member of the American Standards Assn. committee working to establish standards for fluorescent ballasts, said: "With the type of ballast in service today, lamps are being operated 5 to 10% below the rated light output. The ballasts are operating too hot. Manufacturers, engineers, underwriters and others interested need to be brought into a joint effort to develop a cooler, more efficient ballast.

Many architectural and building developments in recent years have complicated the ballast problem, Joe Setter of Denver, Rocky Mountain district ballast sales specialist, and E. C. Pauly, manager, indoor ballast sales, for G-E, told the meeting. Overheating of ballasts has been aggravated by the use of acoustical tile ceilings, lower ceiling heights, mounting of slimmer fixtures closer to the ceiling and use of insulation materials that interfere with normal air circulation.

Dr. Albert A. Sutton, a Pueblo optometrist and member of IES, told the meeting that "function changes structure in every part of your body." He cited several examples of workers, such as old-time shoe cobblers, blacksmiths and others whose bodies developed and changed shape. The same "is true with the eyes," Dr. Sutton said. "Poor illumination can cause stresses that alter the structure of the eye."

Top winners in the two divisions of "My Most Interesting Lighting Job" contest were Norman Winchester, Independent Testing Laboratories, Boulder, commercial entry, and Harold Rosenquist, Public Service Co. of Colorado, residential. Winchester's involved an intricate mirror arrangement to throw light from a 75-w clear lamp through a small hole onto a galvanometer, then through a cross hair and reflect it onto a 12-in. scale. Second in the commercial division was A. C. Anderson, Arizona Public Service Co., Phoenix. Jack Bruno of Pueblo Electric Supply Co. was third. Rosenquist's winning residential entry was the lighting of an elaborate ranch-style residence at Cheyenne, Wyo. W. H. Kellogg, Arizona Public Service, placed second and Carl Balsick, sales manager of Pueblo Electric Supply, was third.

General Chairman Dick Pemberton

MMILJ winners, F. H. Rosenquist, residential, and Norman Winchester, commercial

..at San Diego

The bright lights of Tijuana were visited as a preliminary to the South Pacific Coast Regional Conference of IES at El Cortez Hotel, San Diego, May 11-13. With superb organization directed by Carlton M. Thompson, San Diego Gas & Electric Co. regional vice-president, and J. Walter Howard, General Electric Lamp Division, conference chairman, and an exceptionally coordinated committee of local members, San Diego's first conference was run with precision.

In addition to the national speakers (see p 94 for summary), it had four special features of its own. The 110 men and more than 50 women registered from all parts of California proved that distance is no deterrent. San Diego's hospitality was as perfect as the climate it provided for the occasion.

IES President Kirk M. Reid, General Electric Lamp Division, Cleveland, presented his address to a combined meeting with the Electric Club of San Diego, at which officers of both organizations shared the head table.

The extra features were:

Presentation of a preview of a paper for the IES national conference this fall by J. S. Hamel, consulting engineer, Burbank. In it he showed the need to integrate lighting with air conditioning in calculating the installation. By location of ballasts in an air plenum above the ceiling exhausted to the outside air, less refrigeration for air conditioning is required and hence more provision for illumination can replace it in the over-all budget.

Traffic safety lighting is still a minor part of the highway and road building program, Roy W. Matthews, California Division of Highways, explained as he outlined the appropriations and budgets, both state and federal, for construction and maintenance. Under present circumstances the state division has been unable to show that continuous lighting of long stretches of highway is necessary. Instead pertinent features of the highway system, such as on and off ramps or special conditions where drivers might be confused, are given lighting treatment. While the state standardizes on 400-w mercury in general, it is experimenting with other types of lighting including fluorescent and with black light and even electroluminescent letters on directional signs.

Visibility through the fluids of water and air are being studied in cooperation with the armed forces by the Scripps Institute of Oceanography, Dr. Seibert Q. Duntley showed the conference. Instruments carried under water by divers and into the air and stratosphere by aircraft and balloons were described and illustrated in slides and motion pictures.

Jerre C. Blair, G-E Lamp Division, Los Angeles, and Alan McCutcheon Jr. concluded the meetings by illustrating and discussing what could be done to light modern homes with something of the same efficiency and beauty that the industry provides for business and industry. While deploring the lack of industry appreciation and work on the residential lighting problem, they reported progress in developing awareness on the part of the public for better home lighting.

Humorously advocating research into dark as a means to getting more illumination, William A. Cyr, consulting editor, ELECTRICAL WEST, entertained the concluding luncheon prior to the presentation of awards to winners of the "My Most Interesting Lighting Job" contest. The contest had four residential entries and three commercial, the largest number in recent years. Jack Gates, Southern California Edison Co., Fullerton, won first prize for a job involving inspection lighting of vitamin capsules. Another Edison man, both representing Southern California Chapter, won the residential award for the "dream lighting" of a home on Newport Harbor. Grant Florin was that winner.

Second prize in the commercial class went to Robert Schwartz of United Lighting & Ceiling Co., Oakland, and Ed Spear, G-E Lamp Division, Oakland, for the relighting of the lamp company's display room. Third went to Elton Harris, PG and E, Sacramento, for the lighting of a Cadillac garage in Woodland, Calif.

Other residential awards were made to Robert Haskell, PG and E, San Francisco, for the lighting of a model electric home in Millsdale and to Rex Gardiner, PG and E, San Jose, for the light conditioned home of PG and E and NECA, Edison House in San Jose. Also contesting was Alan McCutcheon of San Diego with the lighting of a contemporary residence. Robert Huff, San Diego Gas & Electric, was chairman.

At a well-attended regional activities breakfast Tuesday Thompson reported that a new chapter known as the Yosemite Chapter in Fresno is about to be chartered and another in the San Bernardino-Riverside area will be ready in September.

Grant Florin, residential, and Jack Gates, both Edison, MMILJ winners

Carlton Thompson, v-p and program, and Walter Howard, general chairman

Jack Cottingham
Oregon Section

Walter Potter
Chairman

Jack Connauton
Edmonton Chapter

Ken Reid
Regional V-P

P. F. Fletcher
British Columbia Section

John Berg
Puget Sound Section

John Morrison
Vancouver Island Chapter

. . at Portland

An international flavor predominated the Pacific Northwest regional meeting at the Multnomah Hotel in Portland, May 22-23. More than 200 of the 470 section members are Canadians and the coming national technical conference in Toronto, Aug. 17-22, and discussion around the proposal to locate the 1959 regional conference at Banff emphasized this aspect.

Walter Potter, General Electric Co., was general chairman of the meeting, which featured the national speakers appearing before other sections (see summaries, p 94). President Reid spoke at a joint luncheon meeting with the Electric Club of Oregon as well as at the Friday banquet.

More than 200 were present to hear the traveling group and speakers from the Northwest.

Beverly Travis, Seattle consulting engineer and candidate for regional vice-president, reported on studies to determine the minimum daylight requirements for different types of classrooms. A year's readings have been made and are being correlated in these continuing studies of natural light conditions in the schools of the Pacific Northwest. While findings are pretty well established, it is too early for a formal report, Travis said.

Portland's "million dollar a year" street lighting program was described by Carl H. Lundell, electrical engineer, city of Portland. Claimed to be the largest and most elaborate modernization program ever undertaken by a city, the installation includes more than 11,643 lights in less than three years.

With 1,200 miles of streets, short blocks and many intersections, Portland is an expensive city to light, Lundell said. However, a comparison of the last three years with the three years preceding the modernization shows that, while daytime accidents are up 9% in Portland, nighttime accidents are down 30%.

Development of new fluorescent lamp ballast designs was discussed by Fred W. Abrahams, assistant to the vice-president in charge of engineering for Advance Transformer Co., Chicago. Today's architectural trend toward lower ceilings with recessed fixtures creates new problems, he said, but the industry is working to cure this and other difficulties as they arise.

The discussion following his talk indicated a desire for less ballast trouble and longer life. It was also suggested that confusion should be cleared up and wider publicity given to the fact that fixtures cannot be surface-mounted against combustible ceilings.

Reporting on lighting trends in Europe, John E. Baker, Vancouver Lighting Ltd., Vancouver, said that the tendency in foreign countries is to put more emphasis on design, less on the amount of light produced. Consequently the lighting shows more imagination but tends to be lower in foot-candle levels than comparable installations in this country. Baker showed slides of student union buildings, castles, churches and other installations where architectural lighting had produced remarkable and dramatic effects.

Chester Jarrett, Portland General Electric Co., showed the latest in his company's model room demonstrations, this one for offices. Jarrett ran through a typical presentation to a cross section of business men who attend service clubs. The complete program takes 30 minutes and the attractive model plus the informal script is a convincing way to tell the modernization story on office lighting.

The office is first shown with typical dark walls and furniture, producing warmth but poor reflectance. Since the model office is used for drafting, it has a high level of illumination but no balancing of brightness. The "remodelled office" has light walls and furniture, correct reflectance factors and controlled brightness.

Public relations value of these lighting demonstrations was pointed out by Jarett, who said that such services create relationships that may be one factor in the decision of who can best be the serving utility.

My Most Interesting Lighting Job contest was presented on the final day, with Frank H. Miehe as chairman. Winners, announced at the banquet, were Grace Schoeni, Portland General Electric Co., in the residential classification and A. G. Drapes, Great Falls, Mont., in the commercial classification. Miss Schoeni won on her presentation of the Electri-Living model home in Portland and Mr. Drapes on lighting a health and physical education center at the state college in Bozeman.

Reluctance of some of the Alberta members to hold a meeting at Banff so soon after the Toronto conference lest attendance be small was overwhelmed by the favorable vote of those attending the regional planning breakfast on May 23. The Banff meeting is scheduled for May 27-29, 1959, opening date for the hotel.

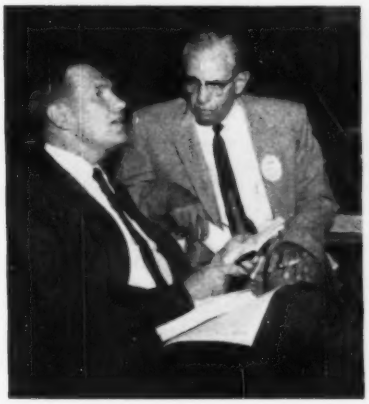
A Nevada Chapter code breakfast led by Les Johnson, standing, and J. Hyde Stayner, seated, started the program at Elko

Inspectors express need for

Less Code—More Training

No new serious problems bloomed in the spring but electrical inspector meetings did throughout the West. Traditionally spring has been the season for annual meetings of several state chapters of International Association of Electrical Inspectors. To others regular meetings are the normal thing.

Nevada Chapter makes a big occasion of it for its small membership scattered over the wide-open spaces. Aided by its godfather, Herbert Ufer, it had top caliber convention talent, some of which overflowed to the Utah Chapter meeting in Provo. Ufer persuaded the new field engineer of NFPA, Frank Stutka, to attend these two, although no other member of IAEI headquarters staff came West this year. Under reorganization yet to be finally settled, the field engineer of NFPA no longer acts as secretary-treasurer of the IAEI as did his predecessors, Charles Smith and Victor Tousley. This fact and the financial crisis facing IAEI was forcefully brought to both Nevada and Utah Chapter meetings by Hal Morr, immediate past president, IAEI, from Salt Lake City. The other chapters were likewise told either by William L. Gaffney, secretary-treasurer, Northwestern Section, or Lou LaFehr, secretary-treasurer, Southwestern Section. A meeting of the executive council in May was set to decide who would head IAEI staff.



Switchboard space and plastic conduit were discussed by Karl Geiges, UL vice-president, and Larry Trim, Burbank city inspector

Electrical inspection is a task of infinite detail. Space here does not permit full detailed reporting of these various meetings. Instead a summation of significant items and actions follows.

Nevada Chapter at Elko

A. P. Gibson, Southern Nevada Power Co., Las Vegas, Nevada Chapter chairman, presided over an audience of 57, a record attendance for the chapter meeting at Elko April 25-27. It opened with a code breakfast over which J. Hyde Staynor, Utah Power & Light, and Les Johnson, General Electric Co., Salt Lake City, acted as co-chairmen. Indeed it was more like a Southwestern Section meeting, so many of its officers and committeemen were there. The educational committee set up by President Barney Alverson on taking office at the Phoenix annual meeting last fall met and Prof. Irving Sandorf, its chairman, reported on the committee objectives and plans to set up educational training material that can be used by chapters or by individual city inspection departments for better training of inspectors. The aim is to develop more uniform understanding and application of the National Electrical Code, more uniform inspection methods, inform the public to the safer use of electricity and promote closer cooperation between inspectors and the industry and pub-

Utah Chapter officers—Abe Bywater, secretary-treasurer; W. T. Haws, Provo, retiring chairman; Norman Hall, Salt Lake City, new chairman. Right—W. L. Gaffney, Tacoma, NW Section secretary-treasurer, explains a code point at the blackboard

lic. It will pool the experience and the methods used in various present educational courses. These courses include ones conducted by other members of the committee, Les Waggoner, Arizona Public Service Co., in the Arizona Chapter, Charles Pierce, Fresno city inspector, in the San Joaquin Valley, President Alverson in San Bernardino County, a new public relations course in Northern California Chapter and others.

Four sections of the code were discussed by four experts. Charles Pierce, who came with a full delegation from Fresno and the Central California Chapter, discussed pictured interpretations of code requirements for service entrance conductors and equipment. Les Waggoner presented a conference-type session on grounding and distributed the standards recently circulated in Southern California Chapter for that area. LaFehr discussed Art. 370—Boxes and Fittings, emphasizing numerous violations of the space factor in such equipment.

Some surprises were provided by Larry Trim who discussed Art. 210—Branch Circuits. After discussing the color code, he told of the application of a straight 480-v, three-phase system to mercury lighting in high-bay units in vast aircraft factories in Burbank. Although not covered in the code, he could see nothing unsafe in their proper application.

Following this Chairman Gibson reported again that his company is still studying the possible use of a 480-v underground distribution system for a residential district. The trial awaits the construction of ranges and water heaters to operate at 277 v. Plastic raceway was likewise discussed and Trim emphasized the necessity to make sure that it is provided with a green grounding conductor.

Karl Geiges, vice-president, Underwriters' Laboratories, Santa Clara, explained numerous problems inspectors recently have put up to Underwriters' Laboratories. Standards for temporary service poles were likewise distributed and discussed.

President Alverson made a masterful talk on public relations respon-

Nevada officers—Rolland S. Tate, North Las Vegas inspector, new vice-chairman; Jack Smales, Elko, secretary; A. P. Gibson, Southern Nevada Power, retiring president—discuss the future

Educational committee, Southwestern Section—Charles Pierce, Fresno; Prof. Irving Sandorf, University of Nevada; Les Waggoner, Phoenix—met at Elko and evolved a program

sibilities of an electrical inspector. (It will be published in full in a later issue.)

The conference ended with a resolution asking the newly created safety division of the Nevada Industrial Commission, which was empowered by law at the last legislature to set up local inspection, to hurry to implement and enforce this law as soon as possible.

In the election of officers E. T. Braswell, California-Pacific Utilities Co., Winnemucca, was named chairman; Roland S. Tate, North Las Vegas building inspector, vice-chairman; Jack Smales, city engineer, Elko, secretary-treasurer; and the executive committee, A. P. Gibson, Lynn Steiner, Howard Lindsey, M. E. Lundberg, Robert Osborne Jr., I. J. Sandorf, Francis Wells and John Kitchen. Winnemucca was selected for the next year's meeting and the date set April 24-26, 1959.

Utah Chapter at Provo

So intent were the Utah inspectors on the code that they were unaffected and undisturbed by the gallery of modern art on display in the auditorium of the Provo city utilities building where they met April 28. The gracious hospitality of the Provo city officials and the utility and the other fine facilities of the building contributed materially to the comfort and pleasure of the meeting. W. Theron Haws, Provo city inspector and chairman of the Utah Chapter, presided.

As they did at Elko, Hal Morr spoke of the association's reorganization, Larry Trim discussed plastic conduits and straight 480-v, three-phase high-bay lighting. Herbert Ufer urged more membership among engineers, architects, city officers to spread knowledge of the good work the association is undertaking. Karl Geiges, brought up a question Sacramento inspectors had posed regarding the lack of space between conduit stubs in the concrete floor under a switchboard location and the lower bus bars. He also announced that Underwriters' can now test switches up to 1,200 amp at the Santa Clara laboratory.

The problem brought about by the importing of foreign equipment was likewise discussed. Underwriters' Laboratories has set up label inspection service in Europe and has had a request from Japan to do so.

Besides reporting on membership, W. L. Gaffney, secretary-treasurer, Northwestern Section, discussed some code coverage that he felt should be made. In particular, he mentioned expanded metal troughs now being used in a great many industries but which are not covered in the code as such. Because of this, there has developed a jurisdictional squabble as to who should install it, sheet metal trades or electricians. Gaffney also announced that the next edition of the National Electrical Code in 1959 will have the new numbering system and re-edited contents. An opportunity to see the first preprints of this will be given this fall.

Utah's State Contractors License Law, enacted last year, formed a lively topic when G. J. Budd of the Utah State Regulations office discussed it. Examinations are now being set up for those wishing to take contractors' licenses in various classifications, he said, and insisted that all contractors in the state must be licensed in order even to bid on work in that state. He further stated that associations and unions were assisting in the writing of the examinations.

Idaho Chapter officers—Park Forte, Boise city inspector, president of the Northwestern Section; Mark Lundy, Idaho state inspector, secretary-treasurer of the chapter

The afternoon session was chiefly on code questions over which L. B. Johnson, G-E, presided ably. Official business closed with the election of Norman Hall, Salt Lake City deputy inspector, as chairman; William Whitten, Ogden city inspector, first vice-chairman; Lauren Graves, Board of Fire Underwriters, second vice-chairman; and re-election of Abe Bywater, Utah Fire Rating Bureau, as secretary-treasurer. A resolution was passed urging members to extend all efforts for the enactment of a state electrical code.

A colorful banquet with a Guatemalan motif and entertainment by local talent concluded the affair. George E. Larsen of the Provo utility department was banquet chairman.

Idaho Chapter at Boise

Unfortunately the Idaho Chapter was victim of the lack of coordination of the spring meetings from IAEI headquarters this year. It held its annual meeting on the same day as the Nevada Chapter, April 26, and thus was deprived of several notables and speakers upon whom it customarily depended. However, J. Carl Baldridge, state electrical inspector, chairman of the chapter, made the best of it and a worthwhile session is reported from those who attended.

Park Forte, Boise city inspector, president of the Northwestern Section, and W. L. Gaffney of Tacoma, secretary and treasurer, who attended, gave the meeting two officials from the section at least.

Ray J. Larrabee, division engineer, Underwriters' Laboratories, Seattle, discussed Underwriters' pro-

IAEI fame attends them—Larry Trim, Burbank, IAEI past president; Hal Morr, Salt Lake City, also a past president; Herb Ufer, Beverly Hills, honorary past president; Frank Stetka, new NFPA field engineer and past president of the Eastern Section; and Lou LaFehr, Alhambra, secretary-treasurer of the Southwestern Section, all at Elko

cedure for the testing of electrical equipment and several of the problems that have come before Underwriters' in recent months.

A code panel was moderated by Gaffney. It consisted of Hy Hansen, Mark Lundy, Park Forte and Ray Larrabee. Questions from the floor were discussed and many answers given as to interpretation of the National Electrical Code.

Topic of considerable interest both in the code discussion and following an address by Bob O'Connor, supervisor of residential and farm sales, Idaho Power Co., was electric heating.

Idaho Power Co. having announced a promotion program for electric heating, the subject of methods of installation, insulation, engineering for proper results, etc., was discussed. Gaffney, coming from Tacoma, where considerable electric heating has been used for many years, was able to give much practical advice.

At the annual election Fred H. Vogt of Blackfoot was elected chairman; H. E. Baker of Lewiston, Idaho, vice-chairman of District 1; Robert H. Lynard of Boise, vice-chairman, District 2; Ralph Foley, Twin Falls, re-elected vice-chairman, District 4; and Mark H. Lundy, Boise, re-elected secretary-treasurer. On the executive committee J. Carl Baldridge, retiring chairman, was named and Ken Marriage and A. H. Gates, both of Mountain Home.

The banquet was addressed by Dr. Walter Ensslin, professor of political science, Boise Junior College. His topic "Will Russia Assume World Leadership?" was given from personal experience in Europe. H. Ferd Koch, Electric Service Co., Boise was toastmaster. Next year's meeting will probably be held in Pocatello.

Three Chapters, One Meeting

Accustomed to hold one joint meeting of the three chapters each year at the time of a visit of an IAEI official, the Northern California, Central California and Sacramento Valley Chapters met anyway this year at Stockton May 3, even though no one came from Chicago. Lloyd Moul, Sacramento Valley Chapter chairman, deputy inspector, Sacramento County, presided. Tony Nastro, also of Sacramento city, acted as secretary. Charles Viss, Modesto city inspector, Northern California Chapter chairman, and Ken Bliss, secretary-treasurer, occupied the head table also. Charles Pierce, chairman, Central California Chapter, Fresno, was unable to be present, although a delegation from that city attended.

SW Section President Barney Alverson, San Bernardino, speaks of inspector public relations at three-chapter meeting in Stockton. At table, Ken Bliss, Northern California Chapter secretary; Lloyd Moul, Sacramento Valley Chapter chairman; Lou LaFehr, NW Section secretary; Charles Viss, Modesto, Northern California Chapter chairman

As he had at the other chapter meetings, Karl Geiges discussed the switchboard problem as well as several other details of inspector questions regarding Underwriters' Laboratories standards or procedures. Pictures had been taken by Ernie Nelson, San Leandro city inspector, of switchboards and conduit stub clearance underneath them. This formed the basis for the discussion of this problem. A motion to refer the problem to the proper code panel for action was passed. However, Paul Mullenbach, BullDog Electric Products Co., pointed out some of the manufacturers' problems in relation to this and suggested that more education be done among contractors in regard to installation of conduit stubs.

Motor controller centers not now covered by Underwriters' labeling may likewise require some study as to whether standards should be drawn up. This was discussed and Geiges, although he thought the matter would eventually be brought into the code, told that manufacturers were very reluctant because of the many complications involved.

A letter from the Los Angeles city electrical department was read setting forth that city's decision not to permit installation of any meter sockets or meter troughing that was not labeled either by Underwriters' Laboratories or the city's own laboratory.

Southwestern Section President Barney Alverson gave his constructive talk on public relations for the electrical inspector, which will be printed in these columns later. He likewise explained the educational program set up by the Southwestern Section. Secretary-treasurer LaFehr told of the reorganization program of IAEI and the possibility that dues would have to be raised for all classes of members in order to maintain an office and executive officer of IAEI on the association's own pay roll.

Oregon Chapter at The Dalles

For the first time a meeting of the Oregon Chapter was held in The Dalles, Ore., March 10 (before the blow fell regarding the Oregon State Code). Harry Baker, Oregon electrical inspector, chapter chairman, presided. Eighty people were in attendance. William Gaffney, secretary-treasurer, Northwestern Section, spoke briefly. He told of an increased use of mineral insulated cable in his area. He likewise suggested that ballast burn-outs and other troubles in high-voltage fluorescent fixtures could be controlled if fixtures were fused separately.

The meeting covered a great many code problems. Among them were connections between aluminum and copper conductors and the use only of connectors labeled AL for aluminum only or CUAL for both aluminum and copper.

Portland's answer to the spacing of fixtures near combustible cellulose materials was likewise discussed at length. Portland requires a ½-in. separation and a motion was passed that similar requirements be used in the area. The next meeting, May 17, in Medford, it was surmised, would be a very lively one in discussing the Oregon State Code problem made by a court decision.

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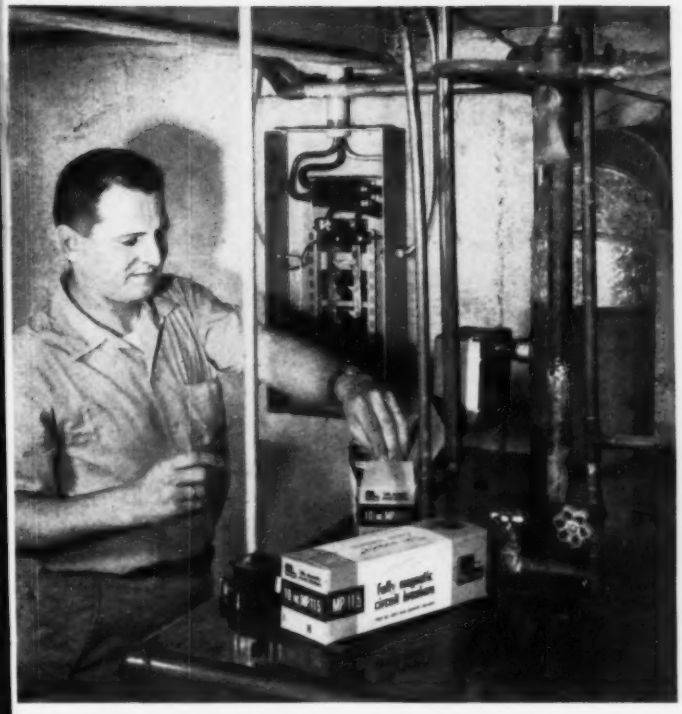

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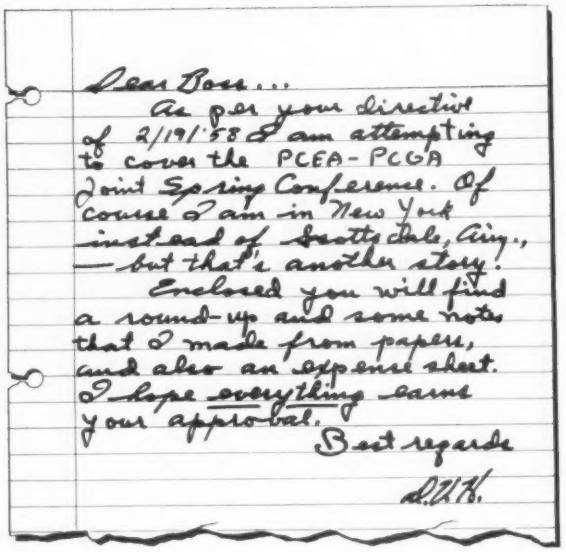
PCEA-PCGA Joint Conference

Takes the Paper Out of Work


Dear Boss...
As per your directive of 2/19/58 I am attempting to cover the PCEA-PCGA Joint Spring Conference. Of course I am in New York instead of Seattle, Wash., — but that's another story.
Enclosed you will find a round-up and some notes that I made from papers, and also an expense sheet. I hope everything earns your approbal.
Best regards
W.W.K.

Building Design and Maintenance

Tailor the office facilities to suit the job, is the advice of H. H. Tracy, Southern California Edison Co., who was a speaker in the Building Design and Maintenance Section. For example: Field people can often get by with wall-hung, shelf-type work stations instead of space-consuming desks. Tracy was assisted by R. R. Garner and Robert S. Campbell from the same company.

Electronic data processing equipment requires special attention to building design. E. J. Ross of Pacific Gas and Electric Co. described a raised floor made of plywood panels covered on the bottom with sheet metal and on the top with vinyl floor tile, and mounted on an open web steel joist system. The big advantage is the flexibility because the system allows locating the equipment wherever it is needed.

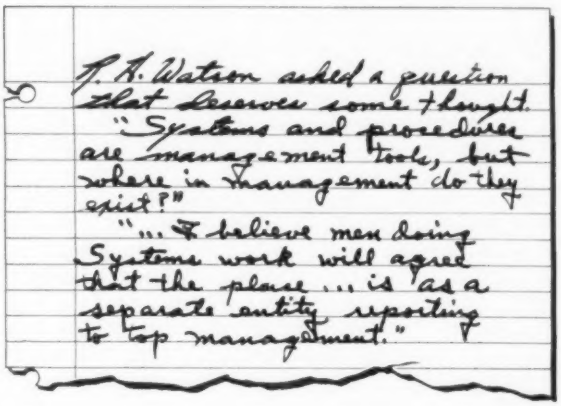
EDP also requires strict control over atmospheric conditions, including room temperature, humidity and dust. Electrostatic filters collect dust, a series of water-spray units in the air supply stream gives humidity control, and an audible and visual alarm system gives a warning in the event of failure of any part of the air conditioning system. Other speakers were: James Kerr, San Diego Gas & Electric Co.; E. E. Cowman, Southern Counties Gas Co.; and Charles Shibel, Southern California Gas Co. Sponsor was G. H. Pickett, Southern California Gas Co.

How do you design flexibility into offices and allow enough space economically for different office functions? Edison company uses two-man offices and makes a special point of locating small organizational units adjacent to large, growing departments so the smaller groups can be displaced as the larger ones expand. In the interest of space conservation, the company has successfully used 45-in. desks in some places, and tables only when the need for them is quite specific.

Frank B. Lee, General Electric Co., described a simplified fluorescent group relamping plan. He advocates replacement of all lamps, and then retaining the best 20% of the used lamps to be used as replacement. Depletion of the replacement stock, Lee said, indicates it is time to relamp the entire building or area, again saving the best 20% of the old lamps as replacements. Benefits cited by Lee are: (1) reduction of labor cost for lamp replacement; (2) reduction of work interruptions; (3) more light delivered; (4) longer life of auxiliary equipment; and (5) better appearance.

Reducing Clerical Costs

Reducing monumental amounts of paperwork is an ambition shared by virtually every utility company. As the group discussed the reduction of clerical costs in operating departments, the subject of searching for unnecessary paperwork became predominant. A general opinion: employees themselves have some of the best ideas for simplification if management provides a means of communication for the employee to use.

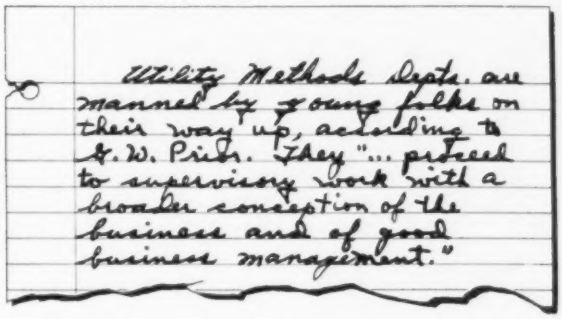

T. K. Watson asked a question that deserves some thought.
"Systems and procedures are management tools, but where in management do they exist?"
"... I believe men doing Systems work will agree that the place ... is as a separate entity, reporting to top management."

Suggestion systems are effective but usually not widely used in clerical or other office work. Internal or external consultants often spot paperwork shortcuts, or supervisors can conduct or encourage constant scrutiny of existing processes.

Under the direction of K. C. Hood, Arizona Public Service Co., various simplification ideas were examined and discussions led by R. D. Pomeroy and T. S. Penfold, Southern California Gas, E. B. Patterson, Southern Counties Gas, and R. M. Potts, Arizona Public Service.

Internal auditors can play an important role in cost reduction by discovering many unnecessary interdepartmental duplications that will not be apparent to any

one department. In effect, they carry on a continuing type of review of methods. Southern California Gas Co. has had the experience of having paperwork reduced by a form committee that reviews all requests for printed forms. The committee is in a position to detect interdepartmental duplications.

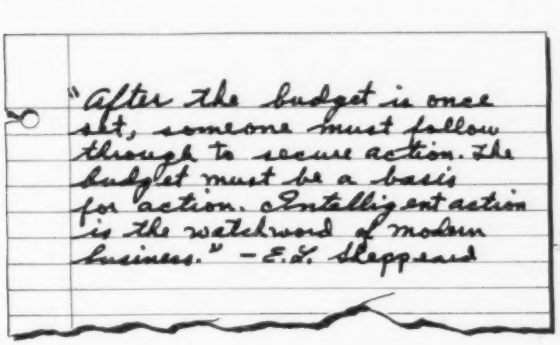

Utility Methods Depts. are manned by young folks on their way up, according to A. W. Pitts. They "... proceed to supervisory work with a broader conception of the business and of good business management."

Meter Records

Those attending the Meter Records Section considered everything from buying a new meter to the last use of the record that the meter supplies. The age-old problems surrounding meter records received close scrutiny at the meeting under the guidance of Sponsor Milt Ray, Arizona Public Service Co. What records are really necessary, what they are to be used for, and whether they become the responsibility of operating departments or accounting departments or both, were all discussed. Generally speaking, conclusions were that utilities must be on guard against duplication of records and that they must constantly search for methods of simplified reporting that satisfy the needs of both operating and accounting departments. Noticeable for its absence in the expensive field of meter testing is the only true basis for frequency of tests—meter performance. T. E. Parker, PG and E, W. C. McDonell, Southern California Gas, M. A. Fredrickson, Edison, and G. J. Sandusky, Southern California Gas, were speakers.

Budgeting and Forecasting

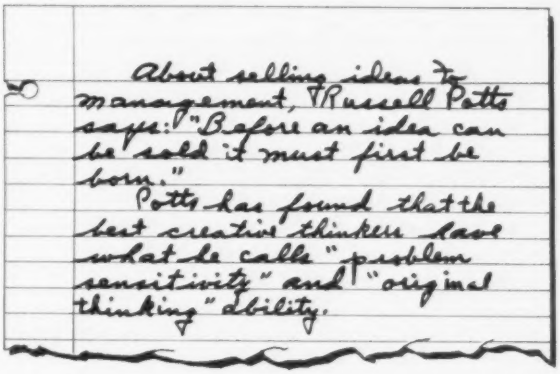
Budgeting and forecasting, a common meeting ground for much discussion, was under the supervision of Henry Sargent Jr., Arizona Public Service Co. Budget


"After the budget is once set, someone must follow through to secure action. The budget must be a basis for action. Intelligent action is the watchword of modern business." - E.L. Sheppeard

preparation calls for coordination of effort, and creates cost consciousness in the utility organization. In its final form, the budget establishes both a goal and a plan, and serves as a yardstick to measure performance. It permits control by exception because only the items that show wide fluctuations from budget need to be considered. It provides a ready means to forecast revenues, expenses or profits. The various facets of budgeting and forecasting were discussed by E. L. Sheppeard, California Electric Power Co., Howard Riehle, San Diego Gas & Electric Co., Norman J. Flack, British Columbia Electric Railway Co. Ltd., and W. H. Cox, Southern California Edison Co.

Systems and Methods

Utilities have a peculiar problem to live with because their financial reporting systems, usually thought of as being indispensable in management planning and cost control, are actually designed to provide reports required by regulatory bodies instead of the requirements of management. H. E. Goodenow explained how Southern California Gas managed to make its financial reporting system meet the needs of a cost control report program. Using a system of functional accounting that is adapted to accounting machine pro-


About selling ideas to management, Russell Potts says: "Before an idea can be sold it must first be born."
Potts has found that the best creative thinkers have what he calls "problem sensitivity" and "original thinking" ability.

cesses, the company has found that the cost of segregating expenses by functions is only slightly greater than the cost of meeting the requirements of the commission. The reassembly of costs accumulated in the functional accounts by prescribed commission accounts is practically an automatic operation. The functional accounting system itself eliminated many of the barriers in the way of creating a responsibility reporting system. Purpose of the responsibility reporting program is to provide more usable and more complete cost data, and to make it available to a greater number of people. Reporting of costs is by areas of responsibility following the company's organizational lines. A cost area is defined as a subdivision of company organization under a single supervisor. Under the system as it is now, a supervisor has: (a) a general idea as to the over-all costs for all activities for which he is generally responsible; (b) detail as to the cost elements of which they are composed; (c) basic flexible cost data that are readily capable of further analysis, and which can be summarized on a divisional, departmental, or system basis; (d) cost information that can be related to comparative data such as standard costs, budget estimates, etc.

Co-chairmen of the joint conference were W. N. Fairlee, Pacific Gas and Electric Co., and H. C. Hammond, Southern California Gas Co. Systems and Methods discussions were under the sponsorship of Harry Dunfee, Arizona Public Service Co.

Three district vice-presidents—W. R. Grasle, Portland, District 6, standing; J. D. O'Connor, Sacramento, District 9; W. Phil Robbins, Salt Lake City, District 8. James Cristiano, NECA director of field organization, at right. They discussed how . . .

Change Challenges NECA

Behind the scenes at the NECA conventions in Tucson and Los Angeles stood a specter—the specter of change. It emerged through the exceptionally strong program at both meetings. Many times it came on stage itself as a warning of things to come.

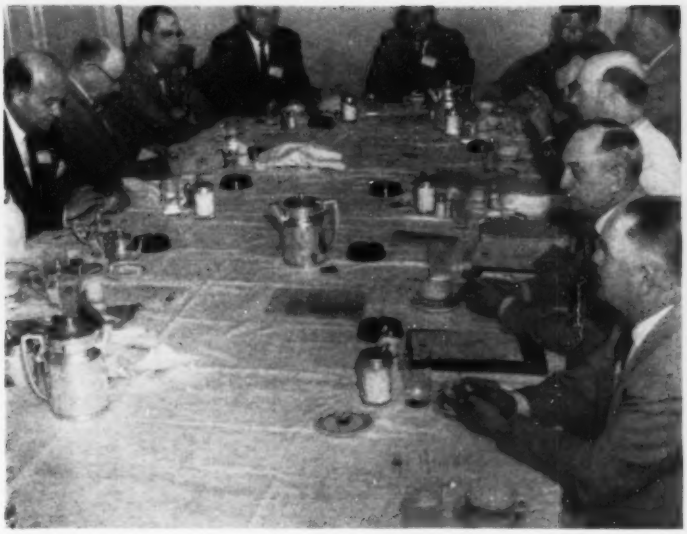
The District 5 17th annual joint meeting of National Electrical Contractors Assn. with District 7, International Brotherhood of Electrical Workers, at the Pioneer Hotel in Tucson April 28 to May 1 and the tri-district convention of the Northwest District 6, the Rocky Mountain District 8 and the California-Nevada District 9, NECA only, at the Biltmore, Los Angeles, May 5-7, had the biggest attendance and the strongest program ever. President Oliver Burnett at Tucson and Executive Vice-president Paul Geary at Los Angeles faced the members with two stark facts.

1. Despite the tremendous volume of electrical construction business, IBEW members are only doing about 60% of the total and NECA members only 25%. This means that a tremendous market is being covered either by IBEW members within industrial plants without benefit of contractors or non-union or by other industrial union workmen.

2. The traditional union-shop or closed-shop method of guiding business to electrical contractors is made illegal by the stricter enforcement of the Taft-Hartley Act by NLRB.

Paul Geary frankly told them that the union cannot be counted upon to assist contractors in getting work. Contractors, he said, have looked to the union both for work and a stable labor condition. They have done so with the closed shop and a secondary boycott to make every job a union job. Without these they are going to see something radically different in the way of operating their business. The change is going to be more severe than they realize. "Like the heart patient, we have to learn to live differently and have a different psychology toward our business," he said.

Dr. Samuel Benesch of Cal Tech (center) blasted off into space while Al Berg, LA Chapter president (left), and W. R. Grasle, District 6 v-p, Portland, took bearings



Separate district meetings were held the first morning. District 8 had a breakfast session; District 9 a large meeting of the California-Nevada Conference of Chapters. W. P. Robbins presided at District 8, J. D. O'Connor, District 9 meeting

One of the major obstacles, he declared, was the contractor's lethargy when it comes to change. Unions, too, are having a hard time to swallow the fact that the labor-management act really exists. Yet the law has been on the books for several years even though its enforcement in the construction industry has only begun.

For contractors, he said the necessity was to become better business administrators and to learn to sell their own services themselves. The unions on their part must also do a better job of organizing the men working in the trade and together contractors and union must do much more to improve the quality of their workmanship by training apprentices and retraining journeymen.

With the union shop gone, some form of employment agency will be necessary but it must be developed along nondiscriminatory lines.

Both conventions were devoted largely to showing contractors the tools NECA has developed or is preparing to aid them to run their contracting as a business enterprise. In addition to the labor relations work which seems to predominate in the interest of most members, NECA has developed a marketing program, apprenticeship training, an estimating system, a machine bookkeeping system and extensive field service.

As all substantial businesses realize, facts must be obtained before developing a program. Two researches were announced at these meetings. S. J. Cristiano, recently appointed director of field organization, emphasized the need for chapters in all marketing areas to maintain and to send in to headquarters area market and employment reports. Their value to the chapters in keeping abreast of what work is being done and who is doing it and other important statistics, Cristiano said, should not only be prepared when taking a case to the Council on Industrial Relations but should be kept current for business guidance.

The other research is being done by an outside agency with the first step in a seven-step marketing program for NECA contractors. Matt J. Sherwood, technical editor, *Qualified Contractor,* and Don Sheldon of Fuller, Smith & Ross, the advertising agency, set forth the steps of the program to measure the market to find out what the public thinks of contractors and what contractors think about their business, to develop a blueprint for future sales programs and, finally, to take these programs to the membership through field classes in the future.

Methods for improving the internal operations of a contractor's business were covered by E. R. Cornish, director of research and training. Particularly interesting was a new machine bookkeeping system developed in cooperation with National Cash Register Co. but applicable with other machine bookkeeping equipment. The NECA estimating, accounting, job management and apprenticeship courses, now being improved and condensed, and a forthcoming business management course, were also shown as ways by which contractors may improve business.

District 5 at Tucson

Arizona and New Mexico are in District 5, which also encompasses several midwestern and southern states. The District 5 17th annual meeting in Tucson, like its predecessors, brought together the progress meeting of the IBEW and the NECA business meeting. Joint sessions were held on three days presided over alternately by NECA Vice-president G. C. White of Fort Worth, and A. E. Edwards, vice-president, District 7, IBEW. From Arizona Al Wendt, now a contractor, former president of Local 640,

President Oliver Burnett, a past Arizonian from Scottsdale, spoke at Tucson meeting

H. D. Esterbrook, Allen-Bradley, said automation can be done with standard controls

described the job management course in Phoenix being conducted by the Electrical Joint Industry Board in which 128 have completed the course. He urged that more contractors should take the course in order to keep up with the knowledge that supervisors and foremen gain from it. E. C. Cannon, Phoenix contractor, told of the promotional tools available to the electrical contractor from the utilities, the Housepower and the Live Better...Electrically campaigns and discussed his own use of NECA's Home Modernization Data Book in the selling of home wiring. Les Waggoner, Arizona Public Service Co., described the joint effort of the industry in the Housepower and the Medallion Home programs. Of the people contacted from prospects derived, 5% have been sold, he said. More emphasis will be made on rewiring jobs. D. W. Reeves, president, Public Service Co. of New Mexico, addressed the meeting, describing the interdependence of various branches of the industry and the dangers of creeping inflation. Only by more productivity can it be controlled, he said, and while manufacturers and utilities have done so, the construction industries have not.

Tri-District Meeting, Los Angeles

Separate business sessions of each of the three districts were held on Monday morning, May 5. Besides the NLRB enforcement situation and a review of business conditions in each area, District 6, presided over by W. R. Grasle of Portland, held extensive discussion of the relative desirability of prime electric contracts vs subcontracts on highway lighting and the methods of selling prime contracts if they are desired by the state highway departments. He also proposed a resolution to the Corps of Engineers to discontinue reduction of prints for bidding purposes.

District 8, presided over by W. P. Robbins, Salt Lake City, proposed Glacier Park for the location of the next meeting in June 1959. This was later approved by the complete assembly. Negotiation training for the negotiators was discussed at length and a desire for complete reasoning on all council cases after their settlement for guidance of negotiators was expressed.

District 9, presided over by J. D. O'Connor, Sacramento, presented plaques of appreciation to Warren Penn, retired executive manager, Los Angeles Chapter, and to R. Goold, previous district vice-president. A legislative committee to work with Ernest Kramm particularly on revisions to the lien law was appointed and a legislative fund to employ full-time people on watching of state legislation was suggested.

An exceptionally strong group of speakers was presented at the general session. At a joint opening luncheon with the Los Angeles Electric Club, presided over by William Meek, vice-president of the club, A. L. Berg, president, Los Angeles Chapter, host, welcomed the large convention and Tony Whan, dynamic speaker, set the selling keynote for the meetings that followed.

A new frontier for contractors, instrumentation and automation, was the subject of a panel led by Robert H. Warren, contractor. On the panel were Howard Grundfor, Barber-Coleman Co., and H. D. Esterbrook, Allen-Bradley Co., and Eugene Matlin of Atomics International. Lawrence T. Greiner, Pacific regional manager, B. F. Goodrich Tire Co., closed the first day's session with a strong selling talk on

Ralph Johnson decoded his Estimatic system for the meeting at Los Angeles

meeting a competitive market.

In addition to the machine bookkeeping and a review of national research panel activities, Ralph E. Johnson, president of Estimatic Corp., Denver, described the coded method for deriving accurate estimates of electrical materials and labor.

A surprisingly understandable and good-humored talk on the space age and some of its practical aspects was given at the noon luncheon Tuesday by Dr. Samuel E. Benesch, Jet Propulsion Laboratory, California Institute of Technology. On their visit to Disneyland that afternoon the convention delegates were enabled to try the rocket trip to the moon in Tomorrow Land to increase their appreciation and reality of the space age.

After Paul Geary's address on national trends affecting the contractor on Wednesday, a panel on lighting was led by Allen KnicKrehm, contractor in Los Angeles. Roy Bevan, Sylvania Electric Co., Creighton F. Davis, Advance Transformer

The well-organized real workers—

Stan Brekhus Comptroller — **Charles Stetson** Host — **Andy Hannon** Banquet — **Charles Wikle** General Chairman

Line Constructors Chairman Bob Hughes showed wage charts at Los Angeles breakfast meeting conducted by his group

Ernie Cannon, Phoenix contractor, and Jerome Kelleher, Arizona Chapter manager, with Mrs. Kelleher at the Tucson meeting

Co., Ted H. Shepherd, Los Angeles Department of Water & Power, brought contractors up to date on some of lighting's most recent trends. Bevan described the applications and characteristics of the very high output lamp. Davis described improvements in ballasts to provide thermal protection against violent failure of the ballast. Shepherd told of recent research by Dr. Blackwell on the amount of light needed for various tasks. These show surprising requirements for good seeing, much more than previous standards.

At the noon luncheon Robert Gordon, vice-president, Bank of America, gave a straight-from-the-shoulder talk on "Getting Along With Your Banker." He stressed over and over again the necessity for complete frankness and understanding between the contractor and his banker on all financial transactions. He said that most contractors in his experience were miserable in their accounting practices. "You can't ride herd on your dollars until you learn to be regimented enough to keep figures that your banker can rely on," he said.

Although scheduled, Oscar Harbak, vice-president, District 9, IBEW, sent regrets from Honolulu. Hence there was no labor spokesman at the tri-district convention. Charles A. McKeand, president of a firm of consultants, discussed the factors necessary for good job supervision as a means of controlling and speeding productivity. Reports were heard from Stan Adams of Portland, on the national apprenticeship program; C. I. Berrell, Salt Lake City, of the government affairs committee; E. L. Marshall, San Carlos, of the Building Research Institute; S. F. Hill, Los Angeles, from the national codes and standards committee.

Resolutions were passed asking the Corps of Engineers to provide life-size prints for estimating purposes; supporting the AFL-CIO code against featherbedding; and enthusiastic thanks to the Los Angeles host chapter for the hospitality and the fine convention arrangements and program. Total registration was 440 men and women, of which 51 came from the State of Washington, the largest attendance for the nine-state meeting.

The Line Constructors group had a separate meeting at breakfast Tuesday, presided over by Robert Hughes of Spokane. At this meeting the basic problem was that of labor and inability of line contractors to compete in obtaining line construction work from utilities.

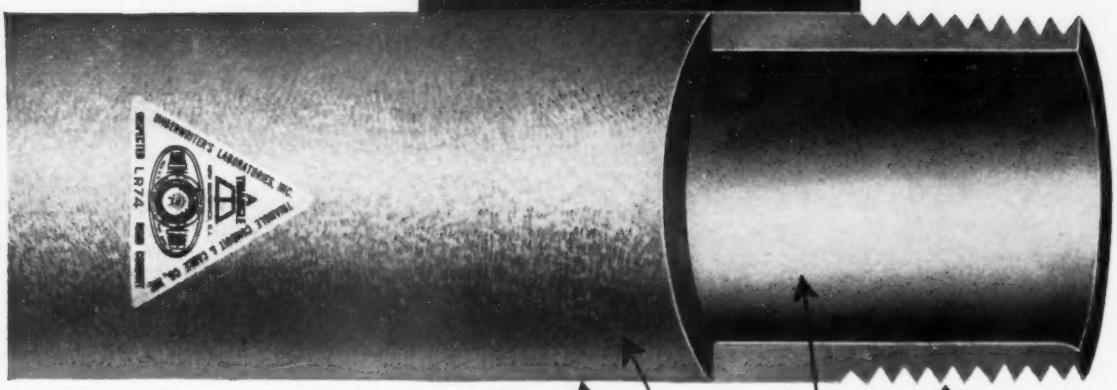
In a subsequent meeting the line contractors in California and Nevada reorganized and chartered a new chapter, electing Oscar Chagnon as president; Charles Wikle, governor; Ed Wismer, vice-president; Stan Brekhus, San Bernardino, treasurer. Dexter Jewett, NECA field representative, was named acting manager and headquarters of the chapter will be his home in San Diego. In order not to conflict with the jurisdiction of other chapters, the line constructors will work on utility and telephone and not small local jobs usually done by "inside" contractors.

committeemen for the successful convention . . .

Sidney Hill Program — **Jack Rollins** Secretary — **Graham Holabird** Cocktail Party — **Max Fry** Ladies — **Herb Evans** Registration — **Pat Nagel** Transportation

BEAT **BOTH**

CORROSION and ROUGH HANDLING


All metal protection—no damageable films
Easy bending, cutting and threading — high grade ductile steel
Uniformly heavy zinc deposit, inside and out
No flaking, inside or out, even if crushed

WITH

TRIANGLE

HOT-DIPPED GALVANIZED CONDUIT

Triangle Hot-Dip Galvanized Rigid Conduit is made the thorough way with no short cuts. It costs more and takes considerable know-how to make conduit the hot-dip way, but this is the only way to insure a smooth uniformly galvanized product with no thin spots or holidays for corrosion to get a start.

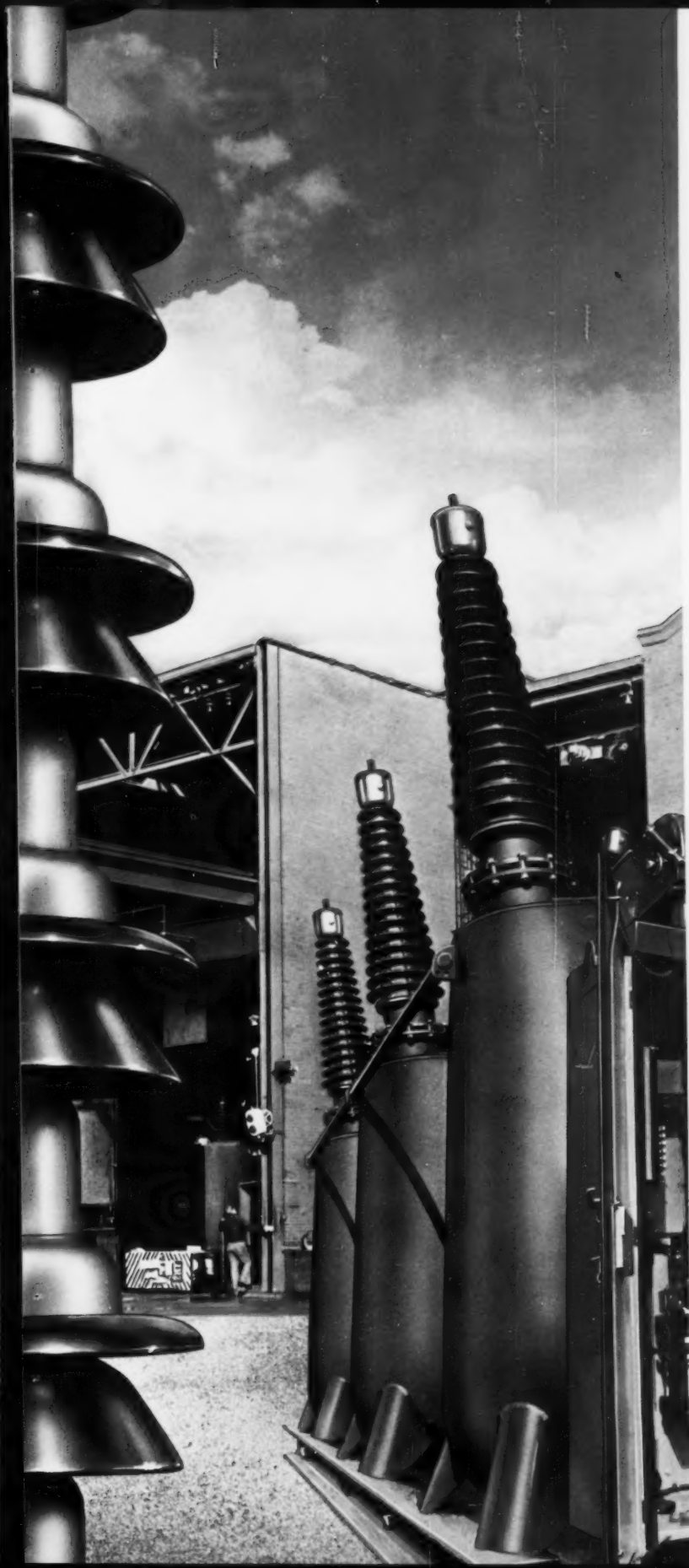
The virgin zinc is alloyed with the conduit walls, so it stays where it belongs in spite of bending, crushing, or rough handling. And Triangle Hot-Dip Galvanized Conduit is all-metal—no need to worry about injury to protective films or flash coatings.

So, when the Code calls for galvanized conduit, make sure you get the best—specify Triangle.

It Must Be Right
The Trade Mark of TOP Quality
TRIANGLE

TRIANGLE *Conduit and Cable Co., Inc.*

NEW BRUNSWICK, NEW JERSEY
MOUNDSVILLE, WEST VIRGINIA



3 million faults... just to prove a point!

WESTINGHOUSE HIGH POWER LAB
IS PROVIDED THROUGH
PLOWBACK
OF EARNINGS INTO RESEARCH

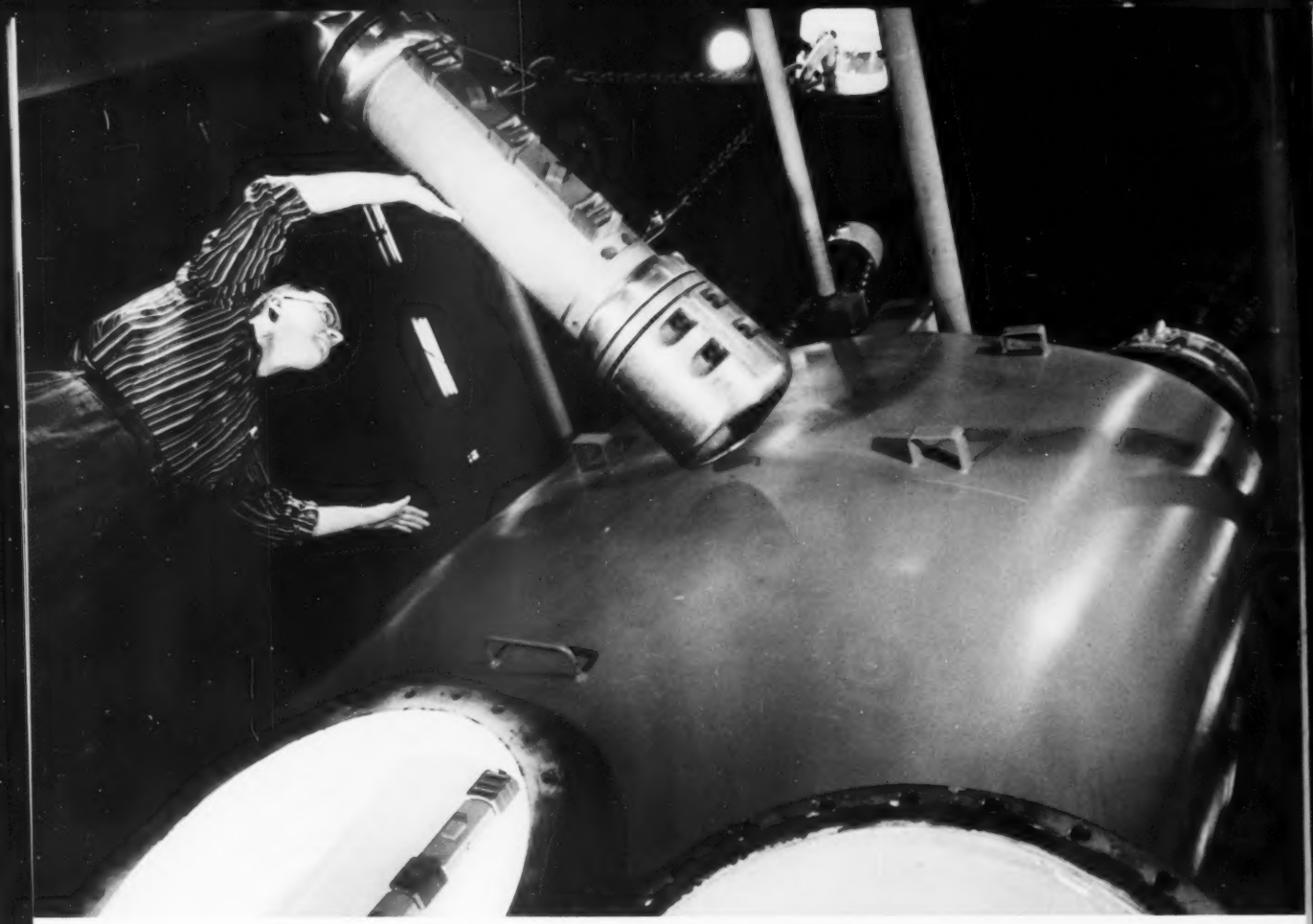
In the 33 years of Westinghouse High Power Lab operation, well over three million deliberate faults have been created to assure our utility customers that they can be *sure* when they buy Westinghouse protective equipment. We *know* the devices will interrupt rated fault currents . . . not from engineering theory alone, but from actual performance under fault conditions the equipment will encounter on your system.

Westinghouse was the first to see the need for this basic proving ground. It has been instrumental in developing many new devices for utilities that have meant greater system stability and continuity. The millions of dollars plowed back into this facility have produced such significant advances as De-ion® Grids, DH Breakers, Compressed Air Breakers and many others.

With the growing voltages on systems today, it is highly impractical to test such protective devices as power circuit breakers on your own system. At the High Power Lab, equipment rated up to 25,000 mva can be tested at any time, and tests up to 345,000 amperes torture equipment to provide the progress to meet tomorrow's system needs.

YOU CAN BE SURE...IF IT'S

Westinghouse



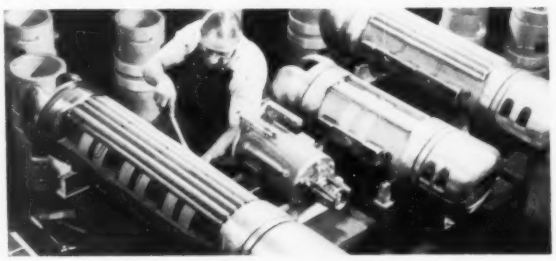
From its very inception in 1929, the Westinghouse De-ion grid has proven capable of interrupting ever-bigger faults by refining and extending the basic design. The familiar multi-break tubular grid, for instance, was designed with four breaks to interrupt faults of 25,000 mva at 345 kv. By adding additional breaks in series, increased interrupting capacities at much higher voltages can be obtained. Such a history of proven capabilities indicates that the sky is the limit so far as eventual capacity is concerned.

440 kv is just around the corner at the Westinghouse High Power Lab

WATCHCASE DESIGN MEETS CHALLENGE FOR INCREASED CAPACITY IN LESS SPACE

Ever anticipating the growing needs of the electrical utility industry, Westinghouse has long been a pioneer in developing equipment before it is actually required. Right now in the labs at East Pittsburgh, Westinghouse engineers are developing circuit breaker components to handle the gargantuan faults possible with transmission lines carrying 440,000 volts. They'll be ready when the industry moves to the next big hurdle in high-voltage transmission.

The fundamental soundness of Dr. Joseph Slepian's De-ionization Theory has been proven over and over again at the Westinghouse High Power Lab as engineers have extended the capacity of breakers, decreased interrupting times and minimized reclosing periods. Here are some of the important industry dividends of the Westinghouse policy of Plowback of Earnings into research:



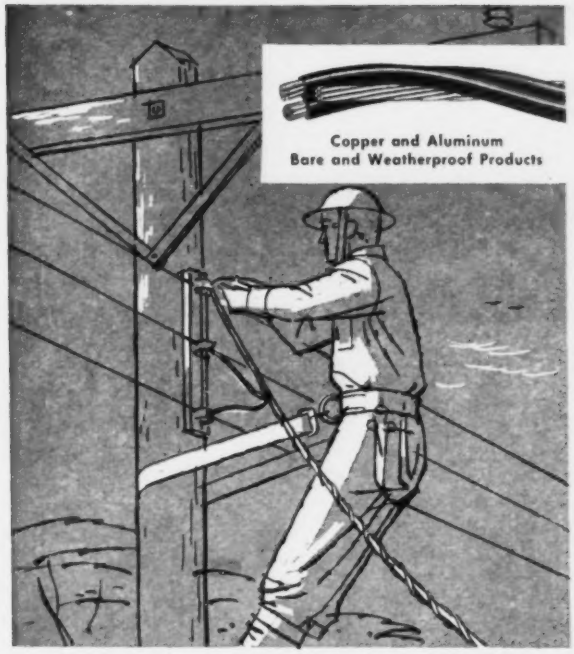
DE-ION GRIDS PROVED STEPPING STONES TO TOMORROW'S SUPER VOLTAGES

Westinghouse solved two big problems with the engineering of the Watchcase* tank: greatly reduced foundation shock of fault interruption; and substantial saving in oil capacity required. The curved shape of the tank bottom equalizes the compression forces over a big area . . . thus cushioning the shock. Careful research and engineering—backed by testing in the High Power Lab—produced the minimum electrical clearance for safe interruption in the tanks. Results: important savings in oil required and the over-all size of tank, pointing the way to higher voltages and greater interrupting capacities.

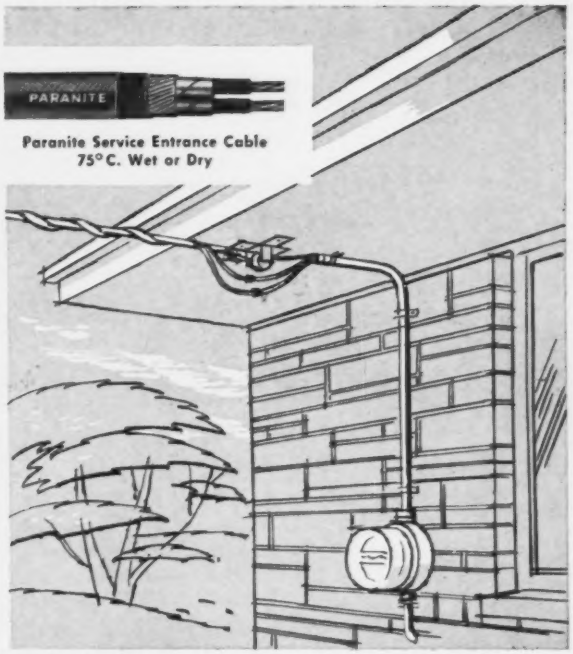
*Trade-Mark

JI-97230-2

YOU CAN BE SURE...IF IT'S Westinghouse



Copper and Aluminum
Bare and Weatherproof Products



Paranite Service Entrance Cable
75°C. Wet or Dry

From Source to Service with ®

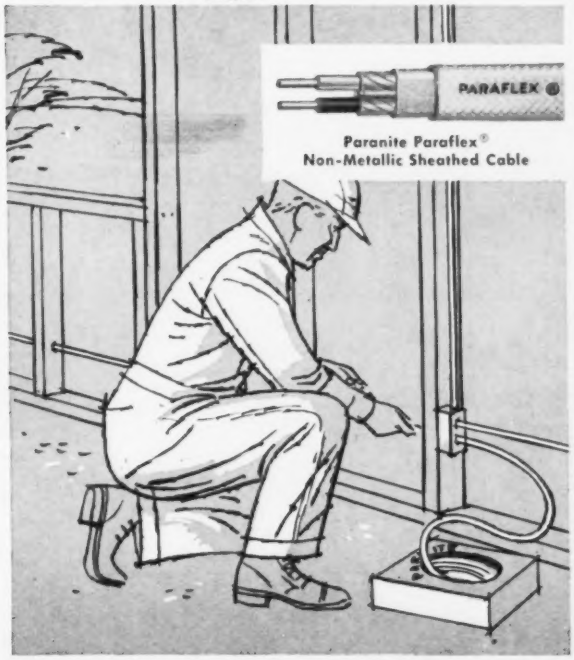
PARANITE

PARANITE WIRE AND CABLE DIVISION

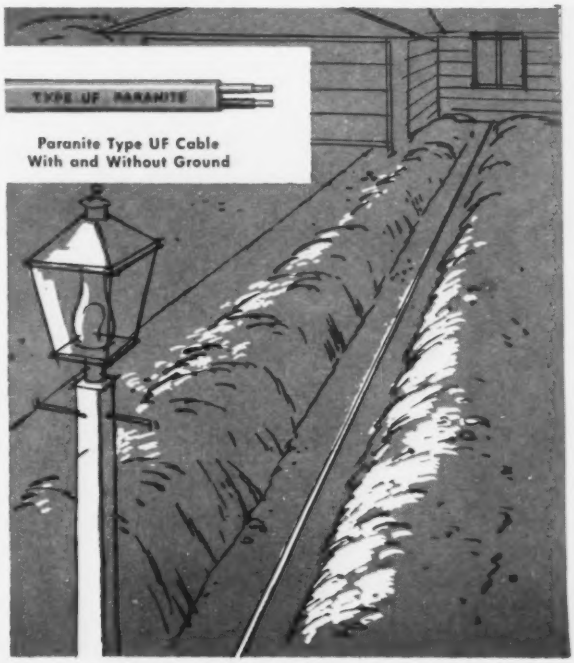
Essex Wire Corporation

FORT WAYNE 6, INDIANA

MANUFACTURING PLANTS: Birmingham, Alabama; Anaheim, California; Jonesboro, Indiana; Marion, Indiana; Tiffin, Ohio



Paranite Paraflex®
Non-Metallic Sheathed Cable



Paranite Type UF Cable
With and Without Ground

Sales Offices in all Principal Cities . . . Sold only through Recognized Electrical Distributors

Ever see tougher operating conditions?

Tiger Brand Amerclad is made for this treatment

ON THE TRACK-TAMPING MACHINE shown here, the cable is flexed 4,500 times per minute. Eight powerful vibratory motors are used to drive eight tamping assemblies. Each motor is powered with Tiger Brand Amerclad cable.

It wasn't always that way. Other cable did a good job—for a while. But the shattering vibration actually caused the jackets to peel away from the conductors. Then Amerclad, with its dynamically balanced conductors and tough, lead-cured jackets, solved the problem. In fact, the manufacturer says, "Tiger Brand is superior to anything we have ever seen for this type of service. It is completely dependable under all conditions."

For an interesting contrast, look at the power shovel pictures, and the three-inch diameter Amerclad. It's the same kind of cable used on the track tamper, only bigger and with more conductors. Operating conditions are different, though. Some of the cable is right in the blast area where it is dragged over sharp rocks and pounded by dynamite-propelled boulders. The cable operates 24 hours a day at temperatures that range from 100° in the shade to minus 40° in shoulder-deep snow.

When you specify Tiger Brand Amerclad, this is the quality you get. We make no second- or third-grade line. *All* Amerclad is made to the same exacting specifications—designed for users who demand the very best because they can't afford expensive down time. Why not call your American Steel & Wire salesman and ask for more information about this quality cable?

USS, American, Tiger Brand and Amerclad are trademarks

Notice the long span of the cable bridge and the extreme flexibility of the Amerclad in the foreground. It's the same cable.

Railroad track tamper is a completely self-contained unit. Notice the eight cables which feed separate vibratory motors.

This is a typical power shovel at the mine. The Amerclad runs along the ties and under the tracks.

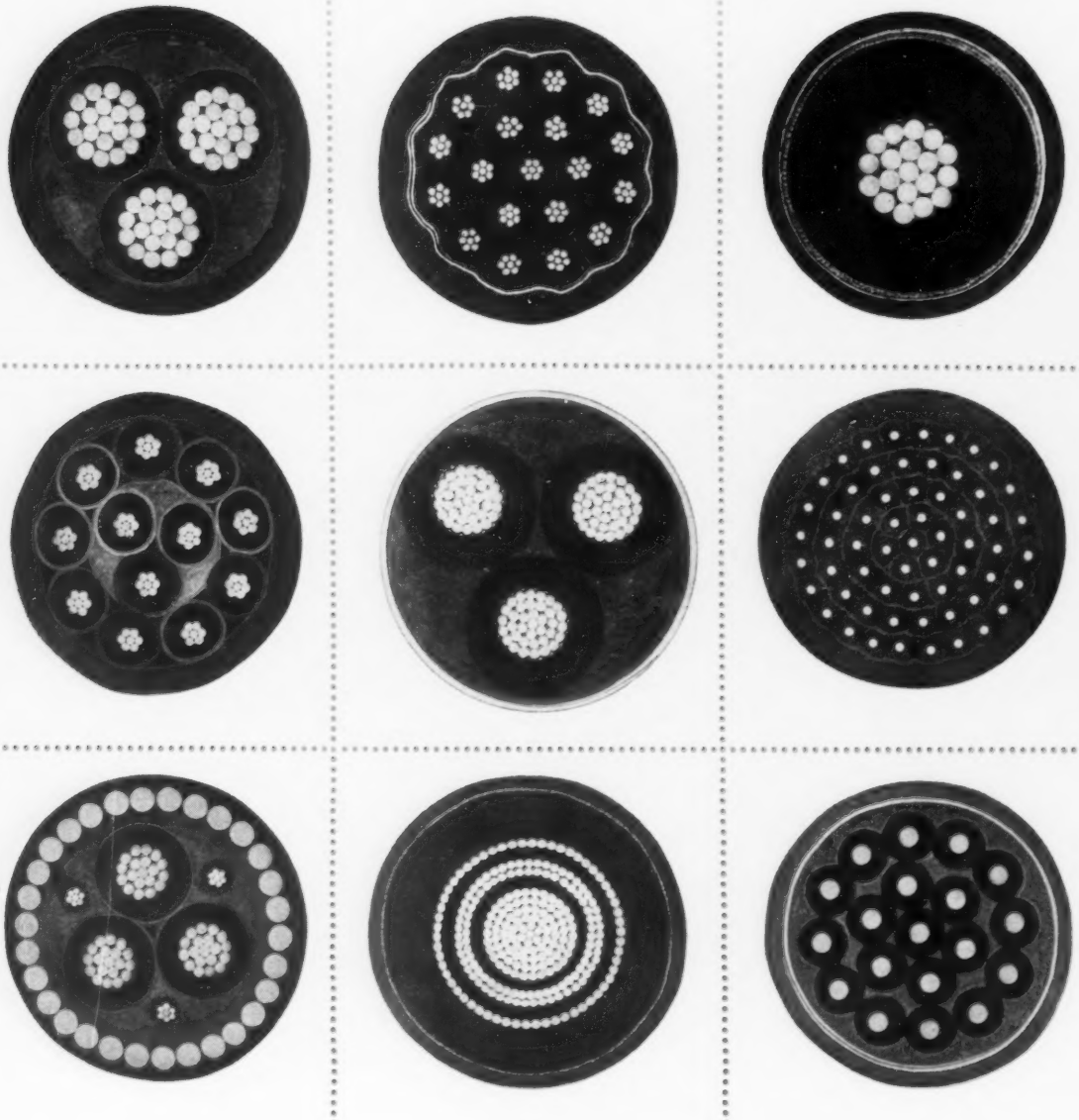
USS **Tiger Brand Electrical Wire & Cable**

a standard Tiger Brand cable for every special job!

Asbestos Wire and Cable • Mold Cured Portable Cord • Shovel & Dredge Cable • Paper & Lead Cable • Varnished Cambric Cable
Interlocked Armor Cable • Special Purpose Wire & Cable • Aerial, Underground and Submarine Cable

American Steel & Wire
Division of USS **United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad



if *you buy cable...*

—take advantage of the unique properties of Kerite insulation. Let a Kerite engineer explain why no other cable can equal Kerite's performance in actual service, dependability, and long-time economy. Kerite cables are designed for a variety of applications and operating conditions, and are available in forms and finishes best adapted to your requirements. Be sure. Specify Kerite.

Our headquarters is at 30 Church St., New York 7. Branches in Ardmore, Pa., Boston, Cleveland, Chicago, Houston, San Francisco, St. Louis, Glendale, Cal.

KERITE CABLE

it's the KERITE *that makes the difference*

DEDICATED TO PROGRESS P R I MEMBER

WATERTIGHT!

Another fine product!

Underfloor Duct by

ORANGEBURG®

For Distribution of Electrical Wiring in Commercial, Industrial and Institutional Buildings

Since 1921 Non-Metallic Underfloor Duct by Orangeburg has been selected for many of the country's outstanding buildings because of its safety, flexibility and low installed-cost. To learn how an Orangeburg Underfloor Duct System keeps a building *electrically* modern for its lifetime, write for Catalog 201.

Orangeburg Fibre Conduit Prolongs Cable Life

Keep out corrosive ground waters, and you prolong the life of underground cables, say utility engineers!

Why? Because ground waters containing corrosive elements derived from the soil and concrete encasement attack cable sheath and shorten cable life. Orangeburg's impermeable wall and self-sealing Taper-Sleeve Joint shed them *"like water off a duck's back."* You get maximum protection with Orangeburg.

Orangeburg protects cables in many other ways. Smooth bore, low co-efficient of friction reduce incidence of abrasion. Its material is strong, tough, resilient, durable.

No other conduit is easier to install

Light, 8-foot lengths and a complete line of bends and fittings speed installation. Taper-Sleeve Joints tap water-tight in a jiffy. Orangeburg lays faster and at lower cost than any other type of conduit.

Orangeburg Fibre Conduit has prolonged cable life at minimum expense for utilities, municipalities and industry since 1893.

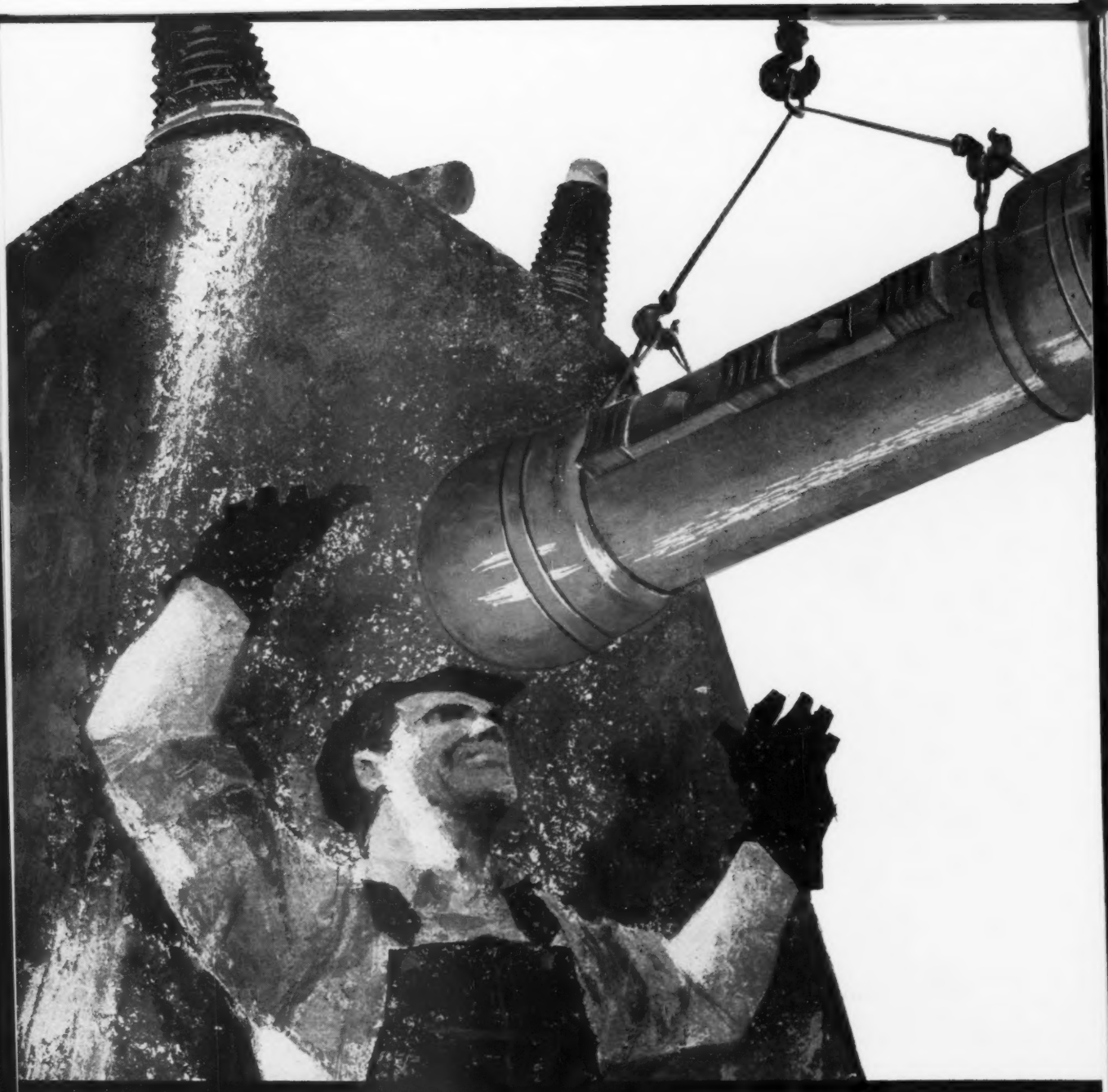
Distributed by Graybar Electric Company and by General Electric Supply Company. Branches and stocks in principal cities.

WRITE DEPT. WE-68 FOR CAT. 52

ORANGEBURG MANUFACTURING CO., INC., Orangeburg, N. Y. West Coast Plant, Newark, Calif.

ORANGEBURG®

FIBRE CONDUIT



Main work-aisle at the East Pittsburgh plant shows the extensive area available for building breakers to meet the demands of rapid system expansion in progress today. At rear is high-voltage test equipment to hi-pot complete breakers and components.

Tank interior reveals the ready accessibility of interrupter grids for inspection or maintenance. Without removing grids from bushing, interrupter blocks can be removed to reveal stationary fingers and moving contacts. Contacts can be replaced in tubes without loss of interrupter alignment.

HIGHER INTERRUPTING CAPACITIES THROUGH WESTINGHOUSE CIRCUIT BREAKER DEVELOPMENT

The outstanding protection provided by today's power circuit breakers is a primary factor in the growing load-carrying ability of modern electric utility systems. Their increased interrupting capacities, higher voltage ratings, faster operating time and improved electrical design all permit increased system capacities, greater system integration.

Every major advance in the art of circuit interruption during the past 50 years has originated at Westinghouse . . . result of a policy of reinvesting earnings into research and development. Here are a few important breaker design contributions:

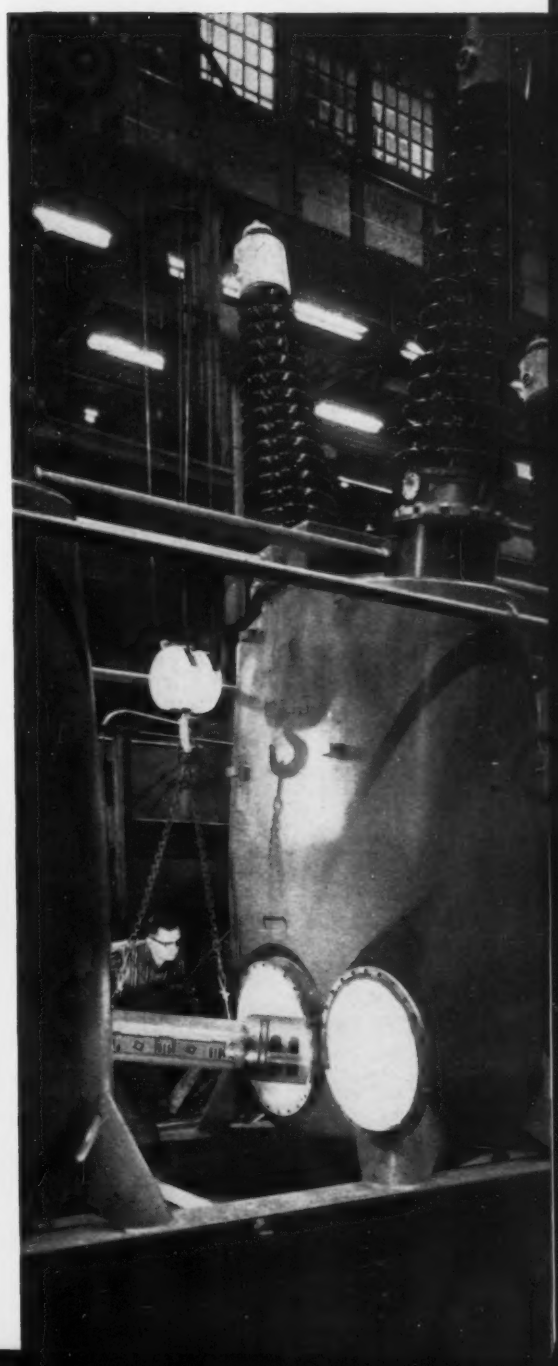
DE-ION® TUBULAR GRIDS — providing the highest interrupting capacities and most reliable operation in all voltage ranges. In addition, these grids allow the easiest interrupter inspection and maintenance possible today.

WATCH-CASE® TANKS — permitting higher voltage and interrupting ratings without a proportional increase in space. Oil requirements reduced as much as one-half with corresponding cut in maintenance costs.

CONDENSER BUSHINGS — developed over 50 years ago by Westinghouse and recently adopted by the entire industry, have proved to be the most reliable and trouble-free bushings ever designed.

Developments such as these are part of a continuing program of research and development which keeps Westinghouse ahead of your system requirements.

When planning expansion of your system capacity, call your Westinghouse sales engineer to learn how you can reduce total system investment, operating and maintenance costs. Or, write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. J-60955



YOU CAN BE SURE...IF IT'S Westinghouse

Specify Clampmatic® control

—to give your customers absolute switching security

For quick-make, quick-break action . . . *absolute switching security* . . . you can't beat BullDog's Clampmatic Control switch unit. Featured in BullDog bus plugs, safety switches, power panels and switchboards, it meets today's electrical needs with more efficiency, less maintenance, greater safety than any other available switching unit.

The exclusive Clampmatic action on line and load jaws doubles the pressure on the movable contact slug. It assures bolt-tight electrical contact when closed . . . and accelerated break when de-energized. The result is cooler operation which provides long and trouble-free switch life. In addition, the Vacu-Break enclosing head smothers arcs, minimizes pitting and burning of contacts.

Give your clients positive switching security with BullDog Clampmatic control. For complete details consult your electrical distributor or BullDog field engineer or write BullDog direct.

© BEPCO

The BullDog field engineer demonstrates large scale model of Clampmatic action shown at left. Clampmatic-controlled switch units include (top to bottom): Vacu-Break Bus Plug, Safety Switch and units for switchboards and panelboards.

We invite you to visit the BullDog Booth at the NAED Convention, June 9-12, Civic Auditorium, San Francisco

HEAT BETTER ELECTRICALLY

BULLDOG

BullDog Electric Products Company, Division of I-T-E Circuit Breaker Company, Detroit 32, Mich. *BullDog Export Division:* 13 East 40th Street, New York 16, New York. *In Canada:* BullDog Electric Products Co. (Canada) Ltd., 80 Clayson Rd., Toronto 15, Ont.

Consult the following Pacific Coast representatives:

Coast Electric & Manufacturing Co.
1733 N.E. Seventh Avenue, P.O. Box 7712
Portland 12, Oregon

Young Electric & Mfg. Co.
2134 Curtis St.
Denver 2, Colorado

Safety Switchboard Company
910—89th Avenue
Oakland 21, California

BullDog Elec. Prod. Co. of Los Angeles
2885 E. Washington Blvd.
Los Angeles 23, California

A MESSAGE TO AMERICAN INDUSTRY • ONE OF A SPECIAL SERIES

Are You Preparing *Now* For The Next Boom?

America's leading companies are not sitting on their hands waiting for the recession to end. They are planning ahead ***now*** for higher sales and near-capacity rates of operation.

These facts stand out clearly from the eleventh annual survey of Business' Plans for New Plants and Equipment just completed by the McGraw-Hill Department of Economics:

- **Manufacturing companies expect their sales to increase 20%, on the average, from 1958 to 1961.** Growth industries, such as chemicals and electrical machinery, expect gains of 25% to 34%.
- **If these sales gains are achieved, the average rate of operations in manufacturing will rise from 78% at the end of 1957 to almost 85% by 1961.** This is the point at which pressure on costs begins to mount, as less efficient facilities are pressed into service.
- **Industry is not waiting for this point to begin getting its plants and equipment in shape for the next boom.** Despite record expansion in the past several years, many manufacturing companies plan to add new capacity in each of the next four years. But, more important, they are going ahead with the vital job of modernization and cost-cutting.

In the years immediately ahead almost two-thirds of capital investment will go for modernization and replacement of present plants and equipment. In this way manufacturing companies can avoid the higher costs and the squeeze on profits that occur when producing facilities are not in shape to handle an increase in sales volume.

These are the plans, as reported to McGraw-Hill, of a wide sample of manufacturing companies—for the most part, large firms and leaders in their respective industries. Altogether, these firms account for almost 40% of all employment in manufacturing industries.

Now Is The Time

How do your plans measure up? Are you planning ahead now for a 20% sales increase in the next three years? Is your company planning to modernize its buildings and equipment more rapidly than at any time in the recent past? If not, here are some of the inducements

that McGraw-Hill editors report from their continuous checking on the state of business.

(1) **There are plenty of opportunities for increasing efficiency by the installation of new equipment and the improvement of layouts in plants, warehouses and offices.** Despite the installation of tremendous volumes of metalworking equipment in recent years, according to AMERICAN MACHINIST over half of the machine tools now in U. S. factories are over 10 years old. Replacement of worn-out and obsolete equipment will mean material savings in operating and maintenance costs.

(2) **Machinery, parts, materials and labor are much more readily available now than they are when the economy is running at full steam.** You can be more particular about quality and about specification to meet your own requirements.

(3) **With lower interest rates and less competition for loans, it is both easier and cheaper to borrow money to finance equipment and construction.** To wait for another boom is to run the risk of having to pay higher interest rates and look harder for money.

(4) **Although there is an adequate supply of most types of labor available now, the prospect is that the supply of factory labor over the years ahead will be tight.** In 1965, there will actually be fewer men and women between the ages of 25 and 44 than there are now. Good factory workers will be either hard to get, or wage rates will rise sharply or—more likely—both. The best answer is to anticipate the rise in labor costs by installing more efficient equipment to increase labor productivity.

(5) **Finally, the costs of investing in new buildings and improved equipment *now* are almost surely less than they will be later.**

These are some of the reasons why many leading firms find ***now*** the best time in years to start on a program of plant modernization. There are other good reasons in the many new products and processes coming from the boom in research and development. This year industry will spend over $8 billion on R & D—$1 billion more than in 1957. And a heavy share of the new product development will consist of better machines and processes to be made available during the next few years. Already the pace of technical advance is so rapid as to call for modernization of plants built only a few years ago.

Years of Opportunity

It has been said that the years between now and 1961 are the "middle years" between two booms. This does not mean a long period of recession, but a period of slower growth—a transition from the postwar boom based on deferred demand, to a new boom in the 1960s based on dynamic population growth and a revolution in technology.

If so, these are the years of opportunity for business—opportunity to prepare for the growth that lies ahead with the most efficient equipment, the most modern plant and the best production organization that can be devised. This is the way to fight higher costs and avert a resumption of inflation. This is also the way to ensure that your company will be ready for its new markets in the 1960s.

Are you planning ahead ***now*** to be among the leaders?

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw
PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

Here are the **NEW GUYS** they're all talking about!

Men who are using the new Copperweld* Type M Guy Strand are already praising its two major features: Economy and Convenience. Through research and new production techniques, it is possible to market Type M at new low prices, yet retain the high quality standards of Copperweld. Consequently, your initial investment is minimized. As for yearly maintenance, it is a long-established fact that there is practically no upkeep with Copperweld.

Pliable and easy to handle, Type M Guy Strand can be readily bent, served, moused or clamped. The thick, ductile copper sheath of each wire will not crack, flake or peel because it is inseparably molten-welded to the steel core.

Write us today for complete details. Our field engineers will be glad to explain the advantages of Type M to you.

*Trade Mark

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION *Glassport, Pa.*
For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

New Copperweld TRADE MARK

TYPE **M** GUY STRAND

2.2M 4M 6M 8M 10M 12.5M 16M

SEATTLE CITY LIGHT'S 230/26-kv Duwamish Substation uses Southern States 34.5 kv-3000 amp Type WAG Switches with Amplitact Contacts.

SOUTHERN STATES TYPE WAG 7.5 — 230 kv — 400 — 4000 amps

The Man-sized Switch for Man-sized Jobs

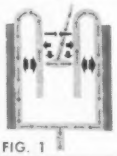


FIG. 1

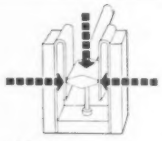


FIG. 2

AMPLITACT® CONTACTS ON WAG

High pressure Amplitact contacts provide maximum dependability under high current short-circuit conditions. The arrows in Fig. 1 show direction and relative magnitude of electromagnetic forces induced when switch is subjected to fault current.

The resultant electromagnetic forces, as shown in Fig. 2, greatly increase contact pressure and positively hold blade in the engaged position. For complete details, write for Bulletin 56AM on the Amplitact.

"Don't send a boy to do a man's job" is a saying especially applicable when choosing switchgear that must safely carry 3000-4000 amperes. Not only must it be capable of carrying such loads after years of service, but it may be called on to withstand fault currents up to 120,000 amperes without damage.

It's a man-sized job. Dirt, industrial waste, years of exposure to every type of contamination make the job even tougher. It takes a man-sized switch!

The Type WAG illustrated above is a good example. It's big and tough enough to carry its rated load continuously without excessive temperature rise. A built in safety factor more than compensates for the deteriorating effects of long, hard service. Amplitact® contacts provide high pressure for handling the heaviest faults.

The WAG is finding wider and wider acceptance in all ratings. It's now in service in virtually every state in the union.

Get complete details from your Southern States representatives or write direct for our latest bulletin.

LIVE BETTER ELECTRICALLY

SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

IN CANADA: Dominion Cutout Co., Ltd., Toronto

Sound decisions are the hallmark of the successful executive. They are the end result of . . .

Solving Business Problems

Dr. Joseph G. Phelan, Ph.D., Personnel Development Counselor, Bechtel Corp.

The human mind is still the best computer known. It solves the myriad physical problems of daily living quickly and accurately. From our sensations and experiences (input data) the mind calculates the right stimuli for motor muscles and commands appropriate action (output). In abstract calculations, such as deciding on a course of business action, the mind can be trained to analyze, evaluate and compute optimum courses of action—within the limits, of course, of the adequacy and accuracy of the data it receives.

The ability to come up quickly with solutions to problems, to give answers which later turn out to have been the right answers, is one of the key qualities which separate the men from the boys in the industrial world. Executives keep the respect of their people by not being indecisive, vaccillating or making too many wrong guesses.

Respect from subordinates comes with the feeling that you, as a leader, know what you are talking about and that your plans, actions and decisions will lead the whole enterprise to economic success.

Decisions must be made under pressure. With practice they can be made with ease; but, more important, they must be sound. Indecisiveness or a penchant to get sidetracked by irrelevant details are not executive qualities.

The question has been asked: Are some men born leaders? Is he doomed to follow who happens to lack some mysterious problem-solving or decision-making quality? Luckily, the answer is: No! Anyone can learn the techniques of decision making. Problem solving is a logical process that can be studied and practiced. Executives are never random or haphazard in their approach to this phase of their jobs.

The following steps are employed by many successful people in solving business problems. The sequence is not necessarily inviolate, for the steps overlap and some people work on several phases of the method at one and the same time.

1. **Locate and define the problem.**

Problems of Management—VI

This sounds easy and obvious, but often it is the most difficult part of the job. The problem is half solved when it can be expressed in a clear statement. In many ways the human brain acts like an electronic digital computer. If the computer isn't asked a clear question, it can't return a usable answer. In terms of the human being, this means that you must define the problem as specifically as possible before hunting solutions for it. It takes careful analysis of what is important and what is fringe or irrelevant detail to cut a problem situation down to manageable size.

One way is to proceed backwards from the obvious result to the not-so-obvious cause. One company might stand still businesswise while its competitors forge ahead. How can analysis help spotlight the specific and relevant causes of the situation? Another way is to try to move back from the general, vague or abstract to the particular. While it may not be possible to cope with the big problem of industrial dissatisfaction, the causes of unrest within a particular unit or department might be attacked. Suppose a maintenance schedule is not being met. Why not? Because absenteeism is high. Is high absenteeism the basic problem to be tackled, or is it merely an indicator of low station morale? By proceeding in this way it may be that the real problem emerges. Possibly it is not how to speed up production, but how to improve morale.

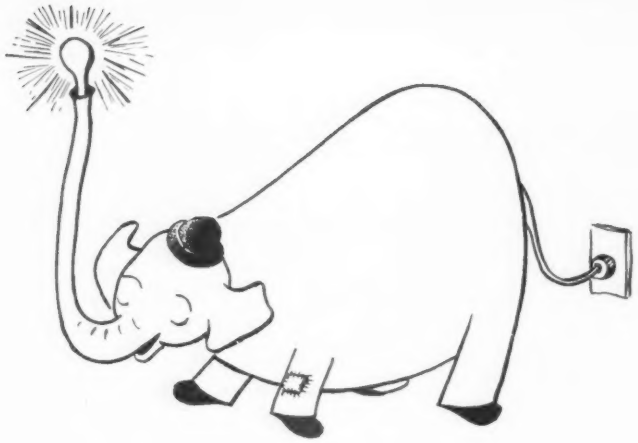
2. **Consider the subproblems.** There is seldom one simple problem. For example, there may not be one simple obvious reason why kilowatt use is down or why profits are reduced. Analysis frequently leads to the discovery that the apparent problem is really made up of several subproblems which can be tackled separately. Try to isolate each component which lends itself to being treated as a problem in its own right. Complicated problems must be couched in terms which are the utmost in simple clarity so that everyone is moving in the same general direction. So often, particularly in conferences, the problem-solving effort gets nowhere because the members are not sure what the problem is, or unable to come to grips with the problem because it is too big or too vague for handling.

3. **Gather helpful data.** Think of the computer again! The electronic brain would certainly give a wrong answer if the operator were careless in the input phase—if he left out some data or put in figures that were inaccurate. The same thing is true of the human mind. That's why it's so important to check the validity of basic facts and to label any unverified assumptions for what they are. In gathering facts, hunt for any patterns, tie-ins or correlations between sets of data which may appear. Groups of facts can be stepping stones to a solution once they are seen in the right, significant relationships.

4. **Select the most promising areas for investigation of data.** Successful heavy thinkers spend time thinking up what kinds of material might yield the most promising answers. Often a group of middle managers work on this phase together. First they free-wheel the question of what general answers they have to get. Then they go into a decision-session to determine which approaches or which areas should be researched first. Dr. Walter Reed, working alone, provided a good example of the technique of looking for the most promising avenues for further search. He was working on the yellow fever problem. Countless experts had worn their eyes out looking through microscopes at blood samples and at bacteria. Reed asked: "What about the insects?" In asking that question, he opened up a new area for investigation which

Check Your Score on Test, Page 13

Nos. 1, 2 and 3 are false. All the rest are true.



"Sure he eats a lot
...but we got him dirt cheap"

With a photoelectric lighting control, like almost anything else, first cost alone doesn't decide how good a bargain it is—you also have to keep *upkeep* in mind. Although anyone working in the operating division of a utility knows this, there's a fast shuffle that goes "So what if you *do* have to replace these little dandies every year? They're so inexpensive you can *afford* to." This argument might hold water, if the bargain price *and* upkeep came even close to the cost of a good control. But when there's a steady procession of trucks, repair parts, spare parts, work lists, check lists to check the work lists, mixed up burning hours and burned up working crews—it's not wise to even mention bargain controls (you might get assigned to maintenance).

By trying to build a control that will operate dependably for the *longest* possible time, Fisher-Pierce hopes to have built a truly economical one. Long operating life results from conservative design—which begins with a field-tested and proven circuit. It continues with careful selection of components, of the right kind and quality, without cutting corners.

The years of *operating* experience behind the F-P Series 63300C and 64400 controls have proved the soundness of the conservative approach. Neither control has a bargain-basement price—neither one is a "cheap" control. What *is* "cheap" is the number of hours of service life they can provide.

The next time an elephant shows up, you might just ask him how much he eats. The Fisher-Pierce Co., 43 Pearl Street, So. Braintree 85, Mass.

FISHER PIERCE
PHOTOELECTRIC LIGHTING CONTROLS
AN AFFILIATE OF SIGMA INSTRUMENTS, INC.

ultimately provided the answer. Sometimes the solution lies up an alley which none has thought about investigating.

5. **Dream up as many possible ideas, solutions, hypotheses as you can.** This is the *creative-thinking* phase of the problem-solving process. Try to stay out of ruts; don't confine any search to facts that only go to support preconceived ideas. Try not to evaluate solutions as they occur. The more possible solutions that appear, the less is the risk of settling for a "good enough," rather than working toward the "best possible" solution.

"Brain-storming" is a group technique employed to mine the field for all possible solutions. By means of it, it is possible to turn loose the imagination, take a look at all—even the most wildly improbable—hypotheses. It is well at this state not to be too critical or evaluative of the various possibilities or approaches that emerge. Get them all on the table; they can be scrutinized for practicability later. Too much criticism too early may kill a good idea in the bud.

6. **Pick out the approaches which seem most likely to lead to a solution.** At this stage the emphasis is on critical judgment. Having gathered together a number of possible approaches, it is time to choose the three or four most likely to succeed. Each has to be analyzed, compared and its relative merits weighed.

7. **Test out alternative solutions for soundness and practicability.** Creative thinking is used here, too, to find brand new ways to test the alternatives. It is laborious, but it pays off. At times, some brand new ways of testing may be called for. Just remember how many alternatives (and tests) Edison tried and discarded before the incandescent light was launched.

8. **What could go wrong?** The cautious decision maker tries to take a good look at all contingencies. Even though trials and experiments make the answer look better and better, prudence dictates a long look ahead to possible consequences which could accrue once action has been initiated.

9. **Announce your decision.**

(Editor's Note: When it comes to decision making, you need almost a split personality. You have to try to be two people at the same time: one the thinker-upper, the dreamer; and the other the judge, the critic. One keeps getting new ideas, the other tries them out for practicability. This works even better if you happen to be identical twins.)

Specify PHELPS DODGE HABIRITE-INSULATED ARMO-LOK CABLE

Phelps Dodge Armo-Lok cable with Habirite (butyl rubber) insulation—a companion to Phelps Dodge Varnished Cambric insulated interlocked armor cable—is more than "just another interlocked armor cable."

Habirite—developed through years of Phelps Dodge experience in the design and manufacture of high voltage cables—is a specially engineered butyl rubber compound. It far surpasses any other type of rubber insulation for dependable service.

Habirite offers these distinct advantages over other rubber insulations:

- Far greater resistance to heat and oxidation with consequent higher temperature rating and lower conductor size and cable cost.
- Far greater resistance to ozone found around high voltage equipment.
- Far greater mechanical toughness.
- Better electrical properties affording a greater safety factor in operation.
- Highest uniformity due to controlled uniformity of raw material.

★ ★ ★

See your Phelps Dodge distributor for information on a complete Armo-Lok system. For catalogue and specification data on Habirite or Varnished Cambric insulated Armo-Lok cable, write: Dept. E-8, Phelps Dodge Copper Products Corporation, 300 Park Avenue, New York 22, N. Y.

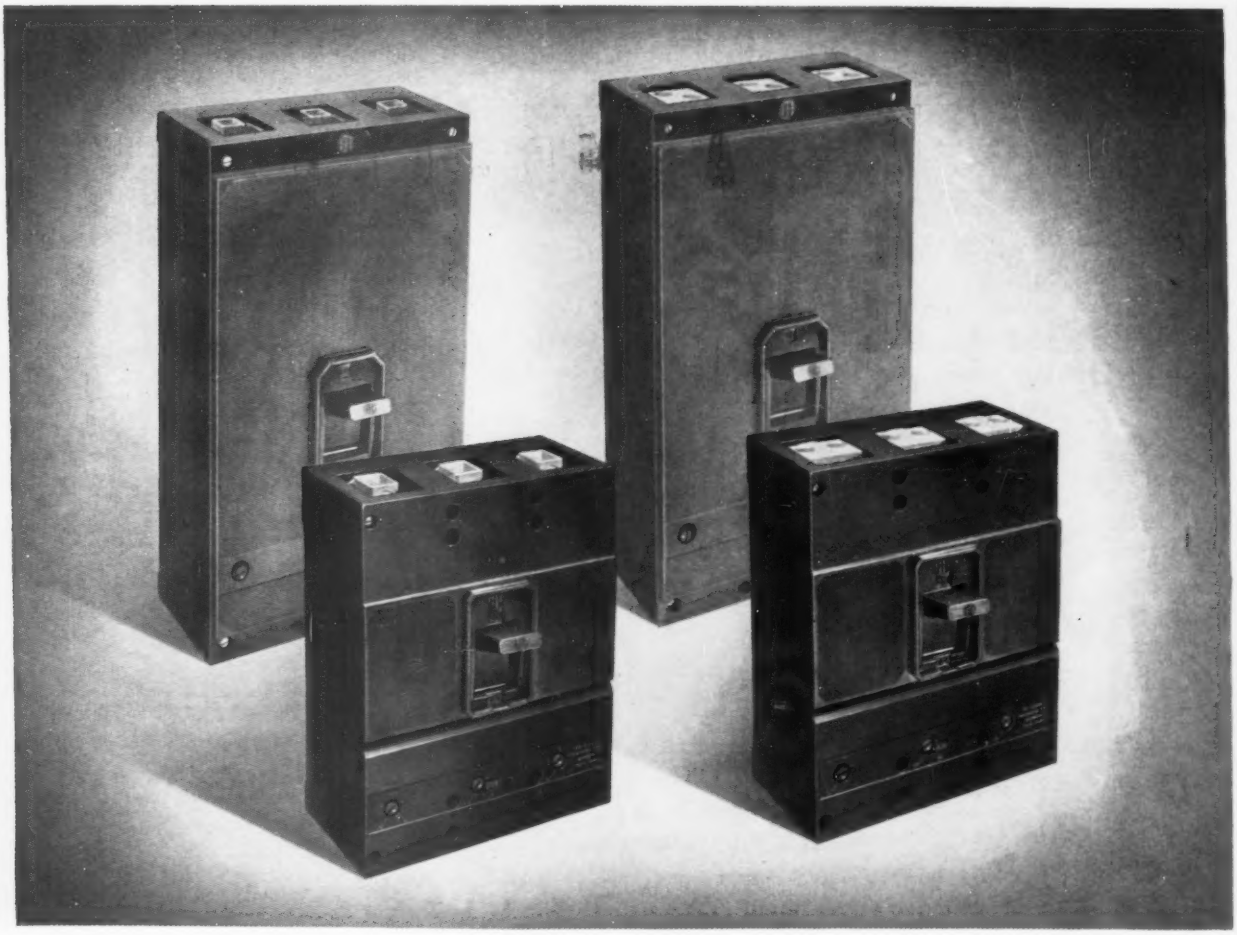
PHELPS DODGE COPPER PRODUCTS CORPORATION

SALES OFFICES: Atlanta, Birmingham, Ala., Cambridge, Mass., Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Fort Wayne, Greensboro, N. C., Houston, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N. Y., San Francisco, St. Louis, Seattle, Washington, D. C.

Announcing

TWO NEW I-T-E Molded

New, compact JK and JKL molded case circuit breakers are the two latest additions to industry's most complete and diversified line



SPECIFICATIONS

	Continuous Rating	Interchangeable Trip Unit	Interrupting Rating	Front-removable lugs	Dimensions
JK	70-225 amp	yes	(at 600 v) 25,000 amp (at 240 v) 30,000 amp	yes	9 x 11 x 4⅛ in.
JKL	125-400 amp	yes	(at 600 v) 25,000 amp (at 240 v) 40,000 amp	yes	9 x 11 x 4⅛ in.

Case Circuit Breakers!

- **Interchangeable trip unit construction**
- **225 and 400 amp continuous ratings**
- **25,000 amp interrupting ratings**
- **Exclusive new front-removal lug design**

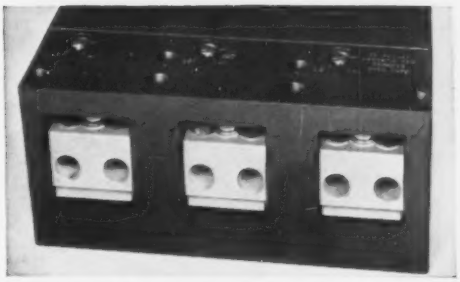
...in a size only two-thirds that of breakers previously required

As one of the pioneers in the electric circuit breaker field, I-T-E has consistently maintained its leadership—not only in developing new products to meet the growing needs of industry, but in constantly seeking ways to improve existing designs.

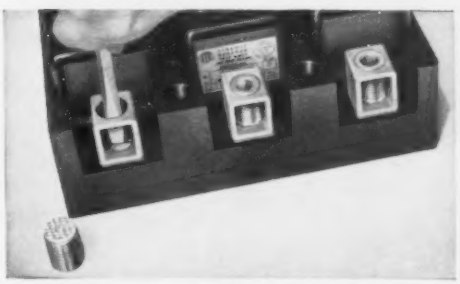
The new JK and JKL I-T-E Molded Case Circuit Breakers are but one more example of I-T-E advances in the interest of continued improvement. They have the same famous built-in I-T-E "extra quality—at no extra cost."

These new JK and JKL breakers are identical—performance-wise—with existing K and KL breakers, and not only do they represent space economy, but in certain instances an actual saving in initial cost. Compare with any other equally rated breaker.

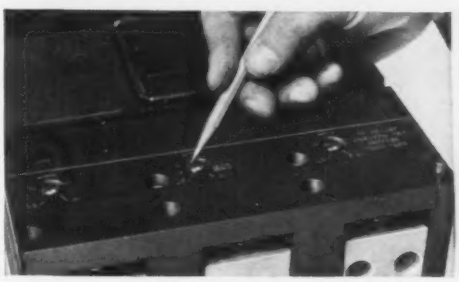
See your I-T-E distributor for details on these new breakers or write I-T-E Circuit Breaker Company, Small Air Circuit Breaker Division, 19th & Hamilton Sts., Philadelphia 30, Pa. In Canada, Eastern Power Devices Ltd., Port Credit, Ontario.



I-T-E Molded Case Circuit Breakers have exclusive, completely enclosed terminals for greater safety.

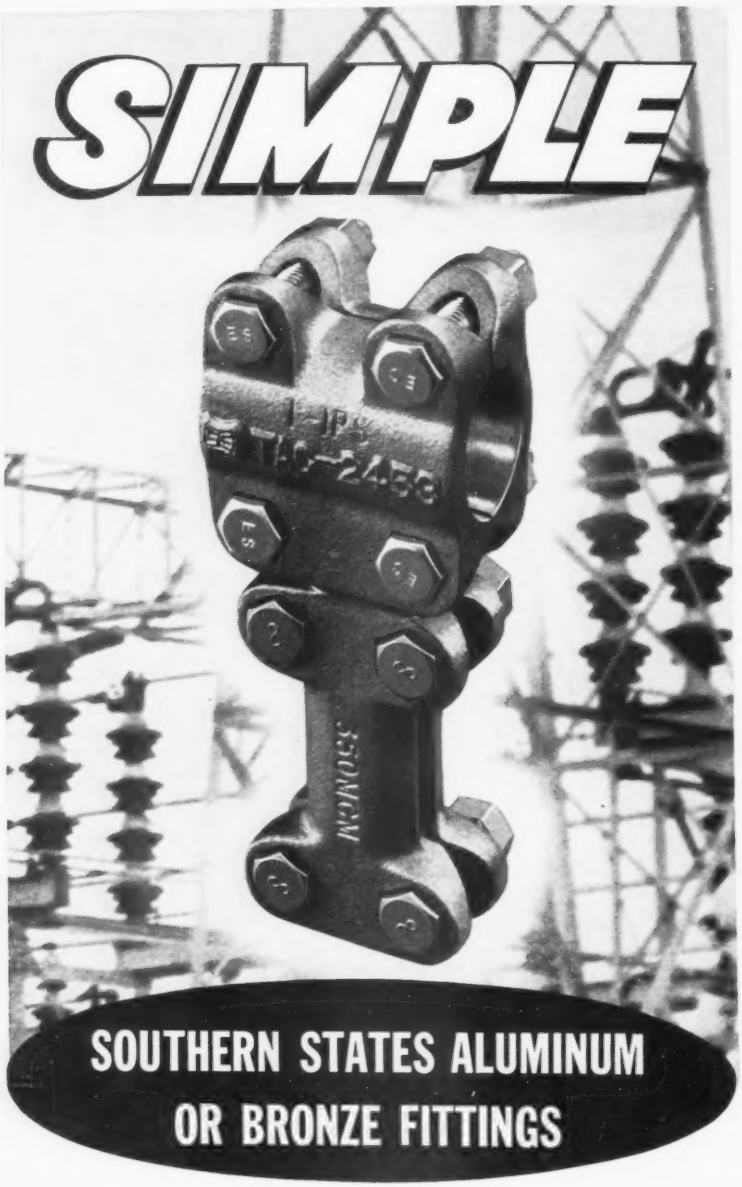


New I-T-E JK and JKL breakers have an exclusive lug which is installed from the front of the breaker. This assures easy interchange of trip units when the breaker is in place.



I-T-E JK and JKL frame breakers provide external front adjustable instantaneous trip design, an I-T-E exclusive.

I-T-E CIRCUIT BREAKER COMPANY
PHILADELPHIA, PENNSYLVANIA



The clean, simple lines of Southern States connectors didn't just happen. The recessed hexagonal bolt heads, or proven alloys, didn't either. Nor did the resultant over-all strength, ruggedness, and durability of these high-quality fittings. All of those characteristics, which you look for in connectors, are the result of careful engineering, backed by more than 25 years experience in producing these products — from drawing board, to foundry, to you.

SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

IN CANADA: Dominion Cutout Co., Ltd., Toronto

Teamwork

(*Continued from page 73*)

ations. Important in this phase of association work is the preparation of manuals and similar literature that aid other people who are on the sales and construction firing lines. PCEA, for example, has prepared manuals on farm electrification, electric heating and air conditioning, and similar subjects. In a sense these represent practical textbooks for all who otherwise might not have a means of obtaining an impartial discussion and description of a particular subject. "Workshops" of various types, such as metering, electrical living and homemaking, are another training and educational activity best carried out on a broad industry front through association activities.

Panelists also commented on the training for additional responsibilities that is provided by membership participation in the various association activities. Committee work, program planning, meeting arrangements and the preparation and presentation of papers all tend to train participants for larger responsibilities, better relationships with others and a broader viewpoint on industry problems and activities. These values, it was noted, are particularly important today, because of the need for selection of future supervisory and management people.

Sharing Know-How — The formal working sessions of the associations, wherein new ideas are presented, operating experience exchanged and final planning for promotions and campaigns is accomplished, were also cited as one of the most valuable functions of association work. It is at such business sessions that growing technical knowledge is shared and the coordination between national programs and local activities is obtained. One panelist commented that, while all cannot attend these regional meetings, local representatives who do have the responsibility of bringing back to their community the plans, details and mechanics of putting national programs to work under local sponsorship and in consonance with local conditions and objectives.

It is also at such sessions that industry teamwork is developed to meet outside competitive influences and the long-range planning initiated that will better meet future customer needs. Thus these sessions, according to the panelists, provide the one place where coordinated industry effort on a regional basis can be accomplished.

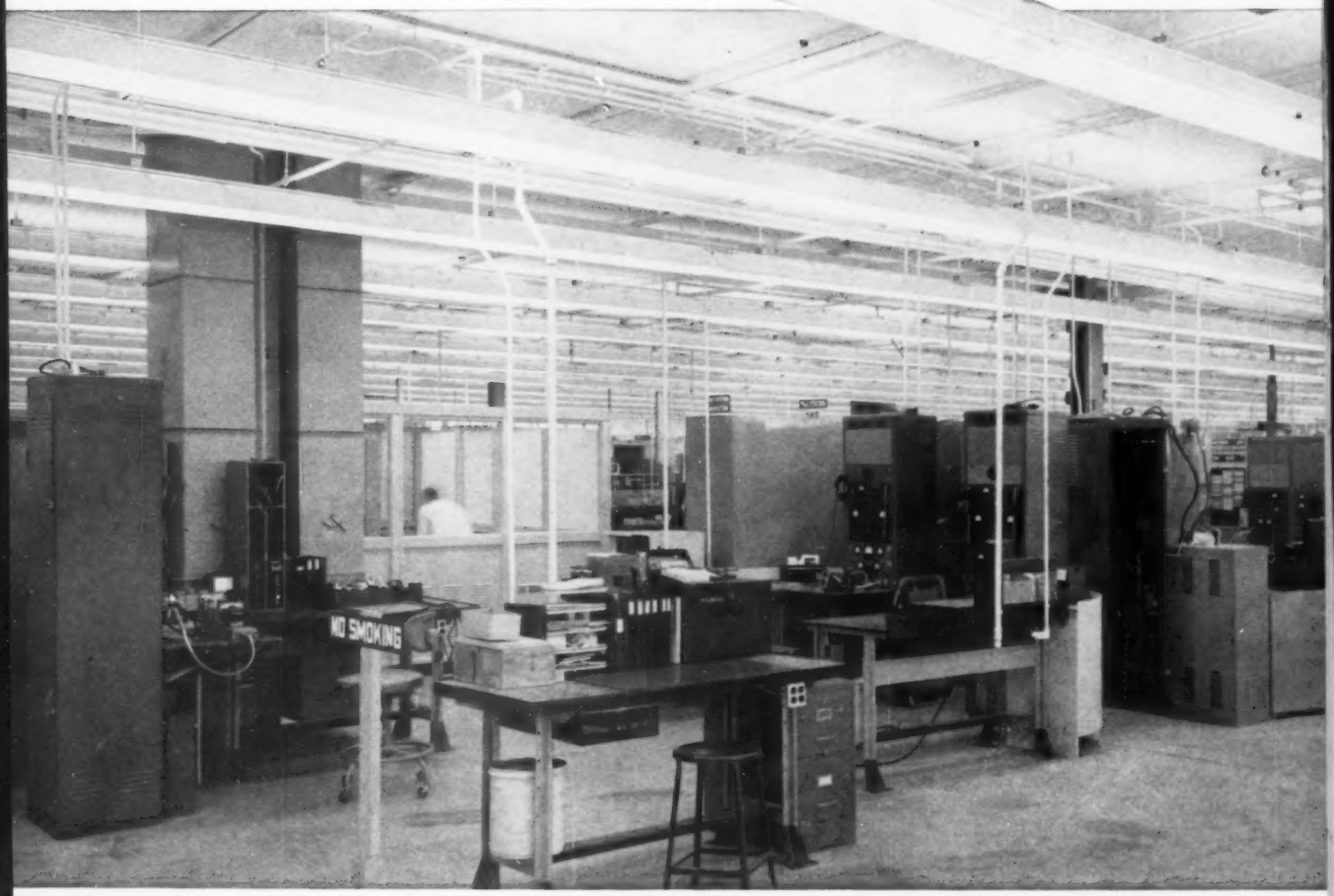
WHEN you consider expansion...
the most important investment
you can make is in
the creative ability of men.

Experimental "air lift" speeds power-line construction in rugged mountain area. Helicopter carries tower components to remote sites, and strings cable.

FLUOR

The Fluor Corporation, Ltd.
Engineers & Constructors
2500 S. Atlantic Blvd., Los Angeles

Day-Brite



Day-Brite CFI-25L fixtures lower ceiling contrast with 25% upward lighting . . . have hinged louvers for 30°-20° shielding . . . furnish 100 footcandles at work level in the Electronic and Accessory Shop at United Air Lines' Maintenance Base, International Airport, San Francisco. H. J. BRUNNIER, *Structural Engineer;* LYLE E. PATTON, *Consulting Electrical Engineer;* EMIL J. WEBER ELECTRIC CO., *Electrical Contractor.*

. . . help stop troubles before they start

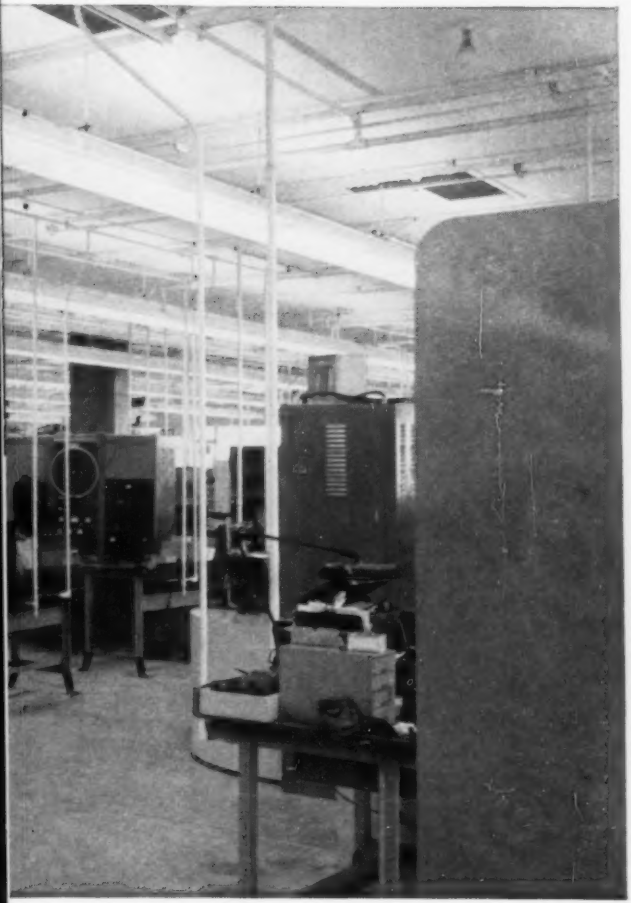
FOR UNITED AIR LINES . . . Periodic inspection of precision aircraft instruments allows no margin for error. High premium schedule, dependability and on-time performance require the finest lighting obtainable. That's why United Airlines selected the high quality Day-Brite CFI (Comfort For Industry) fixtures for their San Francisco Maintenance Base.

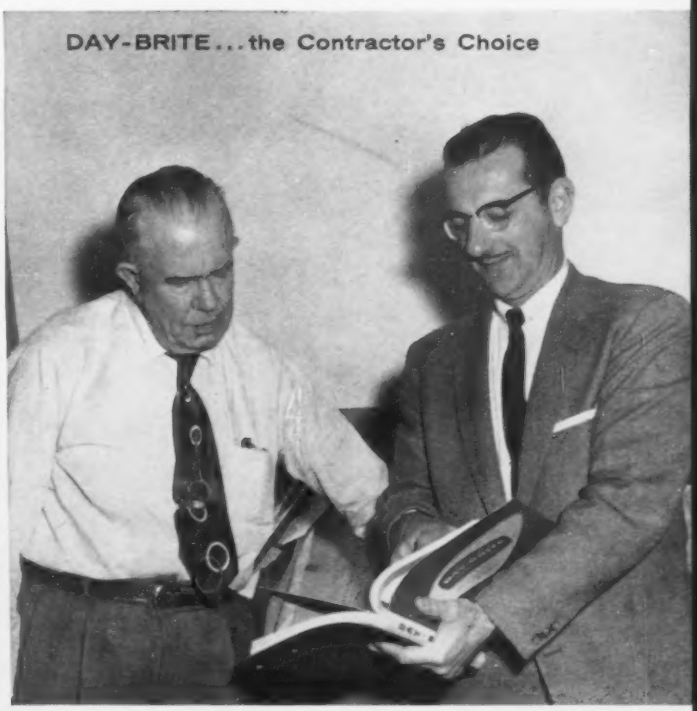
FOR CONTRACTORS . . . Day-Brite fixtures are designed to eliminate installation problems. With exclusive, patented hanging devices that make alignment a "cinch". With machine tooled parts that fit snugly together . . . and factory pre-assembled to save time on the job.

Find out how Day-Brite design and quality can help you *make more money* by stopping troubles before they start! Call your Day-Brite representative listed in the Yellow Pages of your telephone directory.

During mealtimes, too, Day-Brite CFI-25L fixtures provide shadowless, glare-free illumination in United's employees' cafeteria.

CFI® Industrial Fixtures





EMIL J. WEBER (left), President of the San Francisco Chapter of NECA, chats with JAMES L. DELLOS.

"Day-Brite is easy to work with..."

—says Jim Dellos, Manager
Emil J. Weber Electric Co.
San Francisco, California

"In the case of Day-Brite, both the *company* and the *product* are easy to work with.

"Fixtures are shipped to arrive on the job when needed. This coordination of deliveries with our schedules requires close cooperation between the factory, representative and our superintendent on the job. And Day-Brite never lets us down!

"And that goes for Day-Brite fixtures, too. They go up easy, and line up fast . . . *accurately*. Even with less experienced help, Day-Brite fixtures can be installed properly with less supervision.

"Day-Brite service and quality help us operate more efficiently and economically. That's why we're *sold* on Day-Brite, the standard of the lighting industry."

Z-314

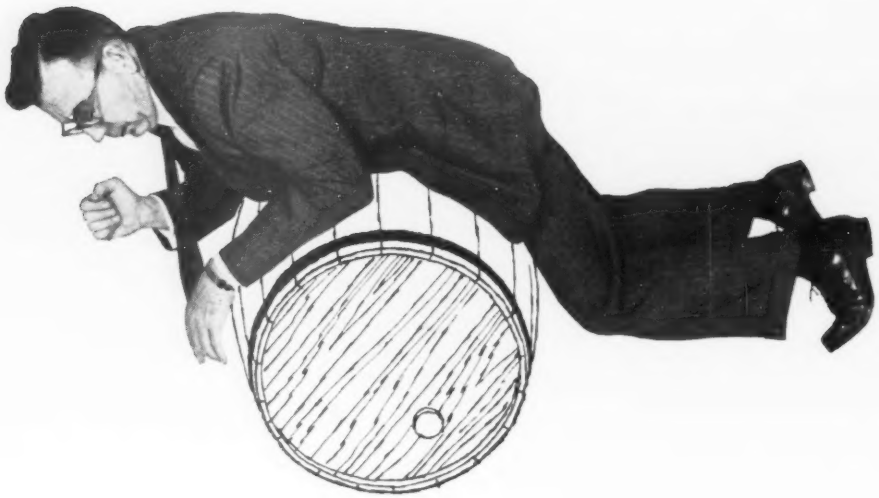
DECIDEDLY BETTER
DAY-BRITE
LIGHTING FIXTURES

Day-Brite Lighting, Inc., of Calif.
530 Martin Ave., Santa Clara, Calif.

Certified Lighting for a Better America

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

High costs got you over a barrel?



See how you can save money on turbine maintenance with

Shell Turbo Oil

the modern turbine lubricant

Shell Turbo Oil cuts maintenance costs because it was *specifically developed* to counteract rust and sludge—the two major causes of turbine wear.

Long after ordinary oils fail, Shell Turbo stops these turbine hazards, shows little change in properties. (Actual case histories show some original charges of Shell Turbo are still effective after nearly 20 years!)

Now is the time to prove to yourself how Shell Turbo can help cut turbine maintenance costs. Call your Shell representative this week.

SHELL

SHELL TURBO OIL

- ✓ **contains most effective rust inhibitor known**
- ✓ **cools and cleanses efficiently**
- ✓ **ends foaming**
- ✓ **developed by lubricant specialists at Shell research laboratories**

Note how ordinary EMT split early in pressure test while induction welded CIRTUBE EMT (shown here unplated) held fast, surpassing UL requirements.

BETTER WELDING

on new CIRTUBE EMT means easier, split-free bending

THERE are many reasons why new CIRTUBE EMT will help you get faster, cleaner wiring jobs. Most of them are listed here.

One *big reason*, however, is *continuous induction welding*—by far the best technique available for making bead-free, split-free welds on high quality EMT.

It is virtually impossible to split an induction-welded EMT no matter how severe the bends. And the perfectly clean weld means uniform roundness—easier, neater bending without the slightest kink or flattening. Your men get it right the first time around.

Try induction-welded new CIRTUBE EMT soon as you can. Your wholesaler has it now—bundled with distinctive orange colored tape to identify the EMT manufactured to Circle's quality standards.

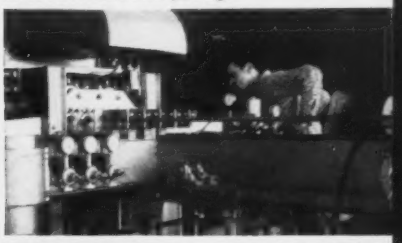
CIRCLE WIRE & CABLE
a subsidiary of
CERRO DE PASCO CORPORATION

PLANTS: Maspeth and Hicksville, N. Y. **SALES OFFICES & WAREHOUSES:** in all principal cities
RUBBER COVERED WIRES & CABLES • VARNISHED CAMBRIC CABLES • PLASTIC INSULATED CABLES
NEOPRENE SHEATHED CABLES • "CIRTUBE" EMT

CIRTUBE EMT *Ask for it!*

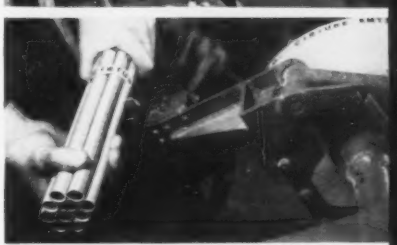
Proper steel plus! The best cold rolled steel plus the right handling give CIRTUBE EMT its natural bendability.

Easy fishing! A baked-on protective coating gives CIRTUBE EMT a built in lubrication for easier wire pulling.



Lifetime exterior finish! Hard galvanized finish for durability; polished satin lustre for lasting good looks.

Automated quality control! Automatic controls assure complete and continuing uniform quality of product.



Tight, easily handled bundles! Bright, orange tapes hold CIRTUBE EMT securely for easy handling on and off the job.

Fast, friendly service! Well-known Circle service through a nation-wide network of well stocked nearby warehouses.

news

A general view of the first annual Electrical Exhibit sponsored in Denver by the Rocky Mountain Electrical Manufacturers Representatives Club. (See Manufacturers)

Looking in to the construction area at Priest Rapids Dam, you see piers for 11 of the 22 spillway bays, the power house at the right of the cofferdam, and the start of the east-bank fish ladders at the lower left. The power house is scheduled to be ready for the turbine generators this year. (See Growth)

"Operation Upturn," General Electric's economic recovery program to build sales and jobs in 1958, gets its Bay Area sendoff from Harry Gerster (left), GESCO regional manager in Los Angeles; W. C. Wichman, vice-president and general manager of GESCO from Bridgeport, Conn.; and C. C. Walker, G-E's Western region vice-president. (See Management)

Ralph Kiser, Edison company, and Bill Cheney, Rossmoor sales manager, look over the bronze medallions that will go on 451 new homes in southern California. (See Market Development)

Management

Operation Upturn Launched by G-E

All of General Electric facilities in the Western region were mobilized to fight the recession under the company's "Operation Upturn." G-E's regional vice-president, C. C. "Larry" Walker, called on the 18,000 General Electric employees in the West for an all-out effort to sell the customer on value and quality and the philosophy of buying now as a means of speeding economic recovery.

Walker pointed out that the time is propitious for special sales efforts because the customers have money to spend, the economy is less than 3% below its record-breaking peaks of 1957 and that a restoration of confidence in the immediate future is all that is needed to spark a continuation of the upward trend.

U.S.-Canadian Power Conference?

A prominent Canadian business leader has suggested a full-dress conference between Canada and the United States to explore mutually satisfactory arrangements for handling power resources. Walter L. Gordon, chairman of the Royal Commission on Canada's economic prospects, suggested that the time has come for a re-examination of the Canadian policy which prohibits the export of hydroelectric power except on a temporary basis. The commission already has expressed an opinion that increasing reserves of natural gas will make possible substantially larger exports of gas to the United States than are now being contracted for and that the export of hydroelectric power, under certain conditions, is a logical and consistent extension of that policy.

While the Royal Commission was sitting in Victoria, the British Columbia Electric Co. presented a brief urging the commission (1) to recommend that Canadian gas should not be exported to produce electricity in the United States but that conversion to electrical energy should be done in Canada; (2) that all future exports of natural gas should be by license only at prices no lower than those charged to Canadian distributors.

The brief stated that B. C. Electric pays 32¢ per 1,000 cu ft for Peace River gas that is sold to the Pacific Northwest Pipeline Corp. at 22¢ per mcf at the U.S. border. Subsequent speakers before the commission pointed out that the Pacific Northwest contract is a "take or pay" deal while B. C. Electric has an option to take only what it needs.

Meanwhile, in Washington Oregon Senator Neuberger was criticizing the State Department for dragging its heels in negotiations with Canada over water resource and power development on the upper Columbia River. Neuberger charged that Libby Dam, authorized by Congress in 1950, has not been built because talks between the two countries have not been productive of the required Canadian approval for the flooding of approximately 15,000 acre-ft of Canadian land by the Libby reservoir.

► Modern Indians aren't passing up a single bet. They have prevailed upon the Portland General Electric Co. to collect a fishing permit of 50¢ per day or $4 per season for fishermen who wish to try their luck behind the new Pelton Dam.

Tribes of the Warm Springs Indian Reservation also receive a monthly payment based on generation (in March it was $8,301). They have rights giving them exclusive fishing privileges in streams on or bordering the reservation. The tribes also share in the multimillion-dollar payment made by the federal government for the flooding of the Indian fishing grounds at Celilo Falls by the John Day Dam.

There's only one catch to the new fishing permit idea. The Oregon State Game Commission says that if charges are to be made for fishing in the lake behind the dam, the commission can't stock it with fish.

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Contract Ends in 2001

One of the first utility contracts that extends into the 21st century was signed between the Portland General Electric Co. and the Bonneville Power Administration. Under its terms BPA will wheel the power production of the Portland utility's Pelton project in central Oregon to Portland load centers for approximately 0.6 mills per kwh. Charges are expected to total about $235,000 a year, based on average water conditions. Terminal date of the agreement is Dec. 31, 2001.

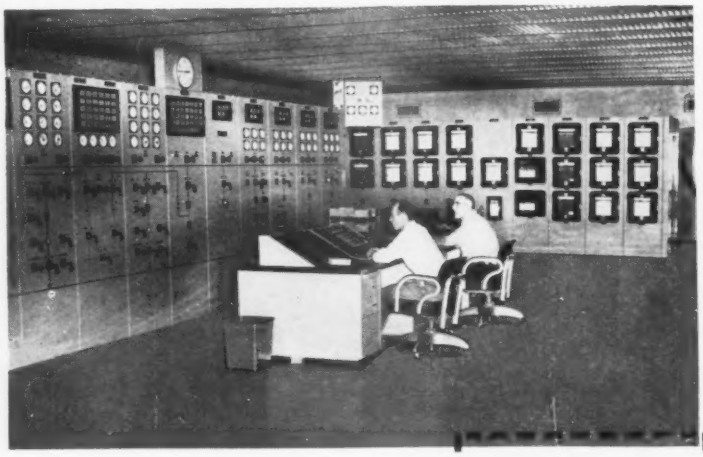
► More than 6,000 people toured the California Electric Co.'s new general office and general service center facilities in the San Bernardino-Rialto area during the four-day open house April 23-26. The utility moved from its former headquarters city of Riverside, Calif. To welcome the company to its new location, the San Bernardino Sun newspaper developed a 20-page supplement describing the history of the company and other features of its growth and service.

Prior to the open house the company held its 43rd annual meeting of Calectric employees, which attracted over 600 employees.

Power Purchase

Puget Sound Power & Light Co. will exercise its option to purchase 8% of the power to be generated at Wanapum Dam, which is to be built by the Grant County Public Utility District upstream from Priest Rapids Dam, now under construction by the PUD.

Previously, three other companies, Washington Water Power, Pacific Power & Light and Portland General Electric, had announced that



100,000 Kw. under control . . . NELSON CONTROL . . . at Gavins Point Dam

This control room, equipped with Nelson instrument panels, control panels and consoles is the nerve center of Gavins Point Dam, South Dakota, which generates 100,000 kilowatts of electricity.

At Nelson Electric Manufacturing Company, engineering know-how and manufacturing skill are combined in producing instrument panels, control panels and graphic panel boards that meet, in every detail, the specifications of each customer.

When quality is important, specify NELSON for the best in electrical control equipment.

a major source of electrical control equipment for industry

NELSON Electric MANUFACTURING CO.
TULSA, OKLAHOMA

they too would take up their power options at Wanapum. Puget Power's share of the Wanapum output would be 48,000 kw and commit the company to about $16,000,000 of the construction cost.

These four companies, together with Seattle City Light and Tacoma City Light and six other power purchasers, have contracted to buy a portion of Priest Rapids power and had an option to purchase a like amount (63.5%) of the Wanapum output.

The two municipalities have not yet decided whether their options at Wanapum will be exercised.

Pay Increases

The San Diego Gas & Electric Co. signed a one-year contract containing a 5% pay increase contract with the local AFL-CIO Brotherhood of Electrical Workers. A similar increase was granted to the company's clerical, technical and supervisory employees not represented by the union. Hourly rates under the new contract are $1.85 to $3.28.

Portland General Electric Co. increased the pay of nonunion hourly employees by 4% effective April 25 and retroactive to March 1. The pay raise followed the signing of a one-year contract with the International Union of Operating Engineers; negotiations with the local IBEW union are still in progress.

Starting June 1, San Francisco journeymen, inside wiremen and linemen will make $3.91 an hour. The union's contract with the San Francisco Electrical Contractors Assn. Inc. calls for a 12½¢ increase to be applied to wages or fringe benefits; was applied wholly to the wage structure.

► Pacific Gas and Electric Co. broke two records last month. At its annual stockholders meeting more than 82% of the shares of preferred and common stock entitled to vote were represented by proxy or in person—the highest percentage for any annual meeting in the company's history. At the present time the company has 225,000 stockholders and 31,085,593 shares of preferred and common stock outstanding.

The other PG and E record smasher was its tax bill for 1957-1958. A total of $54,329,250 was paid for property taxes alone—the largest such bill ever paid in California. Total taxes paid or accrued totaled $128,888,000, representing 26¢ of every dollar received from all sources of company income.

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easy bending . . . easy "fishing"

The smooth, clean inside enamel finish of Columbia E. M. T. makes wire-pulling easy. The galvanized coating prevents corrosion. Every length is thoroughly inspected before shipment—always uniform. Plus, Columbia gives you service that keeps your installations "on-schedule."

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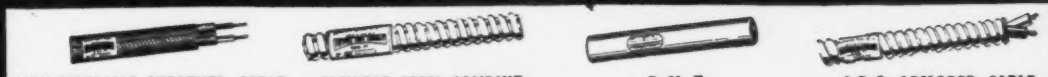

NON-METALLIC SHEATHED CABLE | FLEXIBLE STEEL CONDUIT | E. M. T. | A.B.C. ARMORED CABLE

Sales Representatives: Los **ANGELES**—Frank H. Bran Co., 607 E. 6th St. • **SAN FRANCISCO**—Robert R. Prussia Co., 524 Second St. • **PORTLAND**—The Sanderlin Co., 201 S.E. Washington • **SEATTLE**—The Sanderlin Co., 129 First Ave. West • **SPOKANE**—The Sanderlin Co., 1207 W. College.

With the Contractors

► Disneyland Hotel at Anaheim has been selected as the place for the Southwestern Section, IAEI, annual meeting Sept. 22-24. This followed inability of the San Diego area to handle the 1958 annual meeting. Part of the entertainment will be a visit to the Disneyland Park. A. J. "Tony" Hund, Anaheim city inspector, is general chairman.

Wiring Trends

Mercury lighting on straight 480-v, three-phase circuits, disregarding the code limitation of 300 v to ground, is being used successfully and safely, according to Larry Trim, Burbank city electrical inspector.

Several aircraft plants are using the system for high-bay installation where the higher voltage brings appreciable savings in conduit size and circuit wiring.

Another wiring trend that Trim described to inspector chapter meetings is the use of all-plastic conduit, especially in caustic corrosive locations. He warned inspectors that they must look for the green grounding or bonding conductor in such installations.

NECA

Now one of the 10 largest chapters in the United States, the Santa Clara-San Benito Chapter, NECA, has recently appointed Robert G. Coleman as assistant chapter manager to George Harter. He will handle chapter activities and programs in the southern divisions of the chapter, including Salinas, Kings City, Paso Robles, San Luis Obispo, Santa Maria and Santa Barbara, recently put into the chapter area.

Ray Buckley has resigned as manager of the East Central California Chapter of NECA at Fresno and an effort will be made to reorganize the chapter. President E. J. Frantz is acting manager.

Elmer Electricity, a robot, featured the Denver and Boulder divisions of Rocky Mountain Chapter, NECA, during the annual electrical trade show April 16-18 in the Denver auditorium. Made by Ernie Graham of Belmont Electric Co., it was the hit of the show. The Rocky Mountain Electrical League maintained a booth on adequate wiring and local union No. 68 manned the booth by five white-clad apprentices who also helped out at other booths. Harry Arthur, chief electrical inspector, had a booth featuring devices more than 50 years old and some motors 75 years or older.

A TV advertising program is being sponsored by the Grand Junction group of NECA contractors on the themes of residential and home modernization, housepower, commercial modernization, industrial modernization, Live Better...Electrically, etc. Twelve 15-minute programs are scheduled in 1958. Public Service Co. of Colorado, RMEL and Western Colorado Power Co. in Montrose are contributing talent and speakers but the cost of the program is borne by the contractors . . . The Ogden contractor group is doing newspaper advertising, promoting the same ideas.

► **Los Angeles Chapter,** NECA, heard the Medallion Home story at an evening meeting in the Rodger Young Auditorium arranged by the Department of Water & Power with A. L. Berg, chapter president. Hugh Cate, department representative, explained the way the program has been coordinated by southern California utilities.

► A Western states line construction conference was staged jointly by the Mountain States Line Constructors Chapter and four locals April 24-25 in Billings, attended by 40. James Cristiano, NECA field director, brought news of work at the national level for Bureau of Reclamation, REA and similar line work. Analysis of reasons why utilities, private and public, do not contract more work was made and Doug Ellis described the training and education program in the Pacific Northwest. Both contractors and union faced their problems very frankly and sought a cooperative way to solve them.

► Waco Electric Co., a new contracting firm, has been organized at Denver. The company is headed by W. H. Dabney, formerly with Fischbach & Moore Inc., electrical constructor. Others in the Waco firm are L. A. Dexter, formerly with Hallack & Howard Lumber Co., and John Frank, a mathematics instructor.

► "Garden Lighting" is a new book by Frank B. Nightingale. The book sells for $3.50 each, from Knight Publishing Co., 3800 Canon Blvd., Altadena.

Here are the 22 Graybar Offices in the West

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Fresno:	101 Van Ness Ave. ADAMS 7-4175
Long Beach:	800 West 16th St. HEMLOCK 2-2911
Los Angeles:	210 Anderson St. ANGELUS 3-7282
Oakland:	1911 Union St. GLENCOURT 1-5451
Sacramento:	1900 - 14th St. GILBERT 2-8976
San Bernardino:	655 South "H" St. TURNER 9-1051
San Diego:	720 State St. BELMONT 3-1361
San Francisco:	1750 Alameda St. MARKET 1-5131
Santa Ana:	301 French St. KIMBERLY 3-8309
Van Nuys:	15520 Cabrito Road
COLORADO	
Colorado Springs:	630 West Vermijo Ave. MELROSE 4-3701
Denver:	104 Wazee Market TABOR 5-7111
IDAHO	
Boise:	1325 Idaho St. BOISE 2-4501
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Portland:	Park & Flanders Sts. CAPITOL 7-6641
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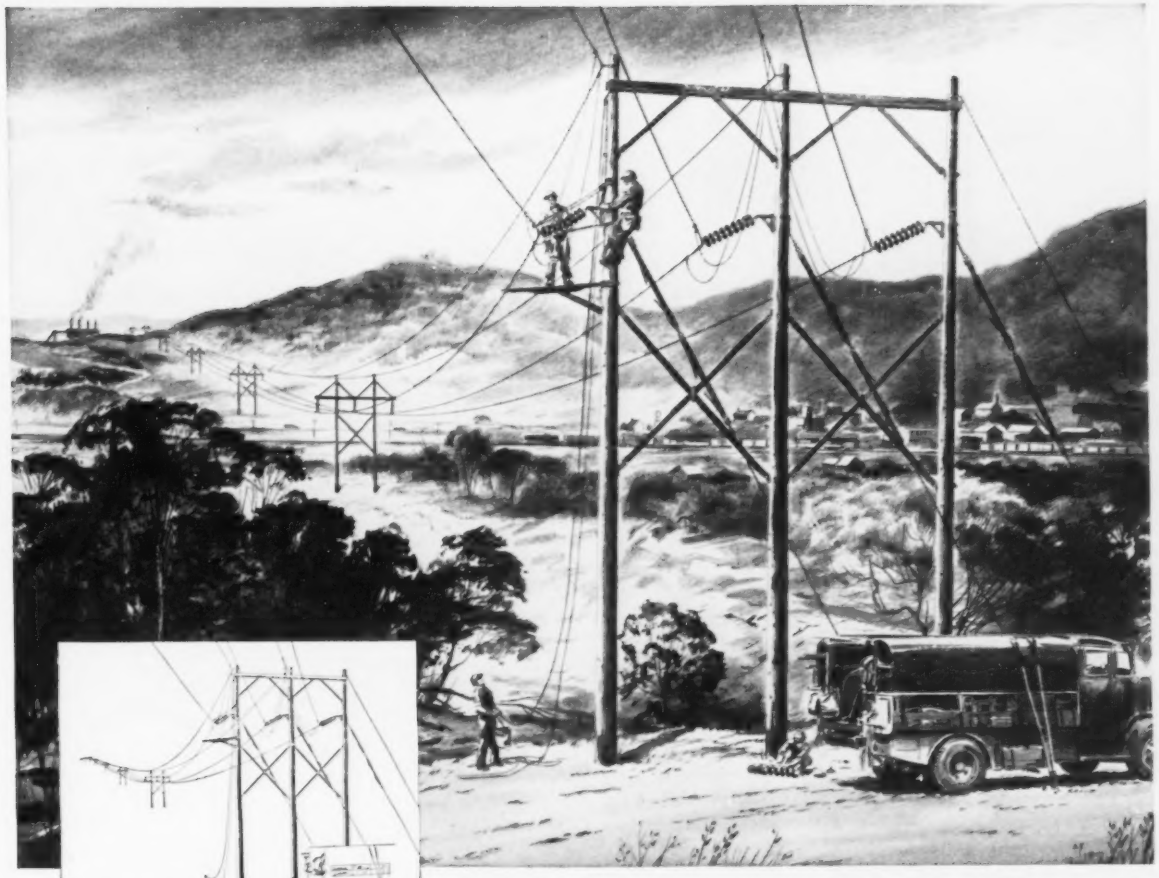
Call Graybar *first* for . . . Everything Electrical GraybaR

IN OVER 130 PRINCIPAL CITIES



You can get prompt help with any outside construction problem through your Graybar office. In over 130 cities there are Graybar offices and warehouses ready to fill your every need for line materials, hardware and tools. And through any of these offices you can get the help of Graybar Outside Construction Specialists, strategically located in 19 principal cities, equipped by training and experience to give you prompt, dependable help.

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Line building can challenge the skill and ingenuity of the best transmission engineers. When the line runs through rugged country, when the specifications are precise, take full advantage of the broad facilities and specialized experience of Graybar. No matter where your job site may be located, no matter what new requirements may be presented in tensions, insulation and erection, call on Graybar for engineering assistance as well as all your transmission line materials and supplies. If you would like to see our bulletin on High Voltage Transmission Line Materials, and you are located in the U. S. or its possessions, write us for your copy. It's complete with illustrations, applications and specifications. It is free, of course. 710

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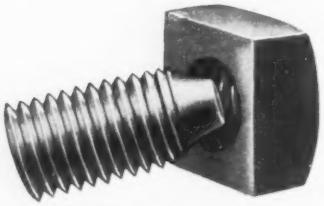
DEPENDABLE POLE LINE CONSTRUCTION *DEMANDS*

Cross Arm Braces

"HANDIDRIVE" Pole Steps



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High Tensile Bolt Guy Clamps

Manufactured and Stocked For Your Convenience On The Pacific Coast

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HONOLULU, T.H.

Association Affairs

PCEA

Memberships are the lifeblood of an association. PCEA lists more than 300 companies on its membership roster and welcomes the following firms that have joined this year.

Manufacturers and Manufacturers' Agents—Cook Electric Co. (E. J. Perkins), Glendale; W. E. Kirk Co. (W. E. Kirk), Los Angeles; R T & E Corp. (Howard A. Dunn), Portland, Ore.; Shalda Mfg. Co. Inc. (William Shalda), Burbank; Southern States Equipment Corp. (Carl F. Selby), Portland; Spang-Chalfant Division, National Supply Co. (Dane O. Egbert), San Francisco; Pennsylvania Transformer Division, McGraw-Edison Co. (W. G. Swoish), Canonsburg, Pa.

Distributors – California Wholesale Electric Co. (R. M. Cooley), Los Angeles; State Electric Supply Inc. (Harry E. Perl), Oakland.

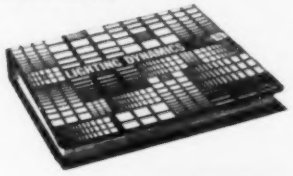
Contractors – Berg Electric Corp (Alexander L. Berg), Los Angeles; Electro Construction Corp. (Myron Freiberg), Los Angeles; Ets-Hokin & Galvan (Jeremy M. Ets-Hokin), San Francisco; C. J. Electric Co. (C. J LoMonte), Los Angeles.

Engineers, etc.—Burns & Roe Inc. (Walter A. Bowers), Yates Center, Kan.; Heil Equipment Co. (J. M. Tuttle), San Francisco; L. D. McFarland Co. (Vern Osell), Sandpoint, Idaho; Yuba Consolidated Industries Inc. (R. S. Milmoe Jr.), San Francisco.

We also now have more than 4,500 individual personal members, the largest list in the 41-year history of the association.

► Its educational program was launched by the Northern California Chapter, International Association of Electrical Inspectors, with a course on human relations and techniques in handling public contract problems. The chapter instituted a six-lesson course conducted by Harry Swift, consultant, to instruct inspectors how to work better with contractors, building owners, people in the field and to adjust differences in viewpoints, enforce compliance and handle complaints. The meetings are held alternate Tuesdays at the Elk's Club in Oakland and the IBEW Union Hall in San Mateo. Thirty attended the first meeting and registered for the course.

NEW LIGHTING DYNAMICS CATALOG



...new fixtures...new ideas...in lighting's most advanced catalog.

Yes, there are "idea renderings" for architects, a cost-range indicator, and templates. For engineers: a lighting calculator, and accurate photometrics—the first catalog completely done with the I. E. S. interflectance method. There's easy-to-use mounting information for contractors, and a simplified ordering system.

It's crammed with new fixtures; and has a much-needed basic organization that makes it easy-to-read, easy-to-use.

Reserve your copy today.

Lighting Dynamics
802 W. Whittier Blvd., Whittier 2, California
Name_____ Title_____
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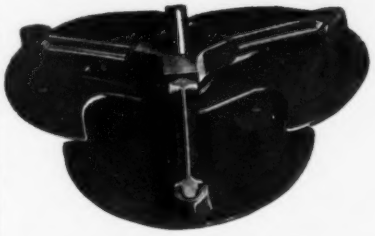
EXTRA Holding Power QUICKLY Installed TOUGH For long life

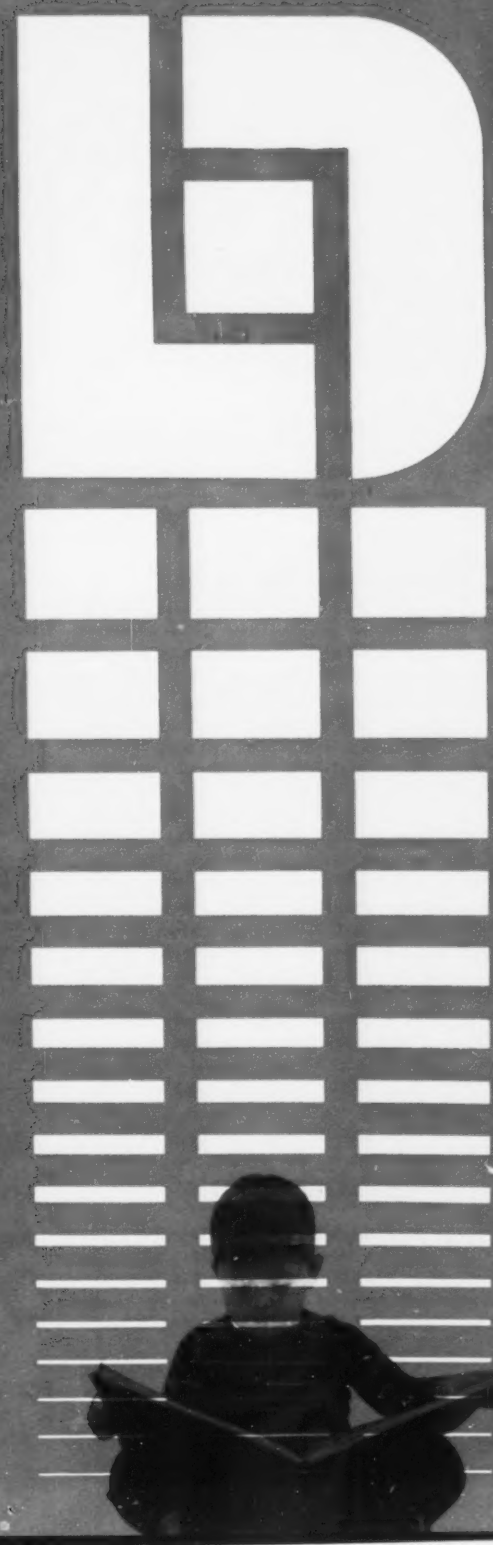


EVERSTICK ANCHORS

For new construction and maintenance—Everstick Anchors speed up work and provide dependable anchorage on all types of jobs. Made of resilient, rust resistant malleable iron. The toughest anchors made. Write for bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

ANNOUNCING LIGHTING DYNAMICS



DEDICATED TO EXPLORING NEW FRONTIERS IN LIGHTING FOR TOMORROW'S MAN

The Atomic Age has created a host of new challenges. One is a coming revolution in lighting equipment. Our challenge: to design lighting fixtures for the whole man, satisfying both his emotional needs and physical requirements. To meet this challenge, EKCO PRODUCTS COMPANY, a seventy year old manufacturing complex with 35 plants around the world, has created LIGHTING DYNAMICS. EKCO has acquired the two modern manufacturing facilities and skilled personnel of RUBY LIGHTING in Dallas and Los Angeles. A new development and design department has been organized. And to ensure the highest quality control there are new photometric laboratories, new Ransburg double electrostatic painting equipment, and a new multi-stage Bonderizing process. WRITE FOR: *the completely new catalog.* LIGHTING FOR TOMORROW'S MAN is the total objective of...

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preferred by linemen
. . . electricians

The name Klein on leather goods is known and preferred by linemen and electricians everywhere. Klein tool belts, safety straps, pouches and pockets represent the highest in quality, the safest in design and construction.

In safety straps, Klein-Kord was the first specially woven fabric strap designed to permit the use of a tongue-type buckle without risk of slitting or ripping, even under severe strain.

Now Nylon Klein-Kord safety straps are the newest Klein development offering maximum safety with maximum flexibility. These are the only nylon straps designed to meet the tests given in Edison Electric Institute Report AP-2.

Free Tool Guide
A copy of the new Klein Pocket Tool Guide will be sent on request.

Foreign Distributor:
International Standard Electric Corp., N. Y.

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7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

Market Development

Sunbeam's marketing vice-president, Clifford C. Mendler (center), takes the wraps off a complete line of electric clocks being introduced in the West. Looking on are these Sunbeam people (left to right): John Sandoval, northern California representative; Charles L. Moore of Los Angeles, Western regional sales manager; W. B. Courtney, advertising manager, and Harold E. Blackburn, product manager, both from the Chicago office

Clock Line Is Introduced in West

Initial production of Sunbeam's electric clock line will be marketed in the West exclusively, it was announced by Clifford C. Mendler, marketing vice-president, who was in San Francisco early in May for the first showing of the new product.

Mendler told Western distributors and dealers in San Francisco for the showing that Sunbeam was working on a solution to present problems —one that would insure a reasonable profit for them. If the industry was going off fair trade, he said, he was glad that it happened when it did instead of during the fall peak selling season.

A Sunbeam market study showed an average of less than three clocks per home, Mendler said. With an estimated 125,000,000 clocks in use, he estimates that there is a market for an additional 350,000,000.

SRVEA Promotions

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Announcing

The 2nd Annual Load Forecasting Contest

West's Kilowatt-hour Load Forecasting Rodeo

A Chance To Put Your Brand on a $500 Block of Stock of a Western Utility

The Object — To forecast the total kilowatt-hour output of the power stations in the 11 Western states for the year 1958, giving reasons for the estimate in 25 words or less. Federal Power Commission figures of kilowatt-hour output will be the final authority.

The Contestants — Any person employed in any segment of the electrical industry in the 11 Western states, Hawaii or Alaska may submit one entry in the contest—using the attached postcard or a reasonable facsimile thereof. Entries must be postmarked not later than June 30, 1958. Employees of the McGraw-Hill company and its subsidiaries are ineligible to participate.

The Prize — ELECTRICAL WEST will award the winner, who comes closest to the actual official FPC kwh output figure, $500 worth of common stock in one of the electric companies serving an area of the 11 Western states. The electric utility whose common stock will be the prize will be determined by a drawing held at the annual Pacific Coast Electrical Assn. convention in Coronado, California, May 14-16, 1958. Stock representing the prize will be purchased immediately after the drawing and held in escrow with any accrued dividends until the winner has been determined. In case of ties, the prize will be divided equally between those submitting the winning figure.

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It's Fun — It's a game of skill — **and a test of your optimism about Western growth. Calculate what this figure will be for 1958! It costs nothing to enter the contest. Just send in your estimate on the attached card, by letter or other postcard.**

To ELECTRICAL WEST's Kilowatt-hour Contest Editor

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Here's why (in 25 words or less). .....

.....

.....

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Name .....

Title or job .....

Company .....

Address .....

City ..... State .....

(Return before June 30, 1958)

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preferred by linemen
. . . electricians

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Title or job .....

Company .....

Address .....

City ..... State .....

(Return before June 30, 1958)

Put Your Brand on $500 of Stock

Use this Card to Enter

ELECTRICAL WEST'S

—Kilowatt-Hour Rodeo—

See preceding page for full details

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No Postage Stamp Necessary If Mailed in the United States

Electrical West's Kilowatt-hour Rodeo
68 Post Street
San Francisco 4
California

Largest Medallion Contract

A contract calling for construction of 451 Medallion homes—largest so far in the United States—has been signed in Los Angeles by representatives of the Rossmoor tract and Southern California Edison Co.

Additional contracts to be signed later are expected to boost the total to 1,000 Bronze Medallion homes to be built in the Rossmoor project near Long Beach.

Bill Cheney, Rossmoor's general sales manager, signed the contract, with Ralph C. Kiser, Huntington Beach district manager of Southern California Edison Co. (See picture, p 136).

Since the Medallion campaign was officially launched in southern California in early March, a total of 2,368 Bronze Medallion houses and apartment units have been contracted for. This represents 23.7% of the 10,000-unit quota aimed at by March 1959.

Of the Gold Medallion units, contracts have been signed for 109 of the 1,500 quota.

► **More on Medallion Homes**—The first farm home to receive the Medallion award in the Inland Empire has been reported by Washington Water Power. A 200-amp main panel; a four- and a two-unit range top, built-in oven, 66-gal quick recovery water heater; ceiling radiant electric heat are a few of the conveniences included. . . . Three model homes—**Hawaii's first** Medallion homes—were opened recently in Honolulu as samples of several hundred to be built in the new Kalaheo Village by the Centex Construction Co.

► **San Francisco's Merchandise Mart** has scheduled its Summer Market for July 21-25; reports that new housing authorized in the Bay Area is 11% above a year ago.

► An **antique contest** held by the Ballard appliance and television store of Mast's Inc. resulted in April sales double those of the month before and also of the same month a year ago. Announced through a mailing to 5,000 persons in the store's trading area, the contest brought 150 entries and lots of floor traffic. The contest was for the "most interesting" antique, with voting by persons visiting the store.

Mast's displayed some antiques of its own, such as a 30-year-old refrigerator taken as a trade-in, together with an old washer, range and vacuum cleaner. Prices and values of the new appliances were compared with those of the appliance antiques, showing how appliance prices have been reduced proportionately over the years.

► The **Denver branch** of the Appliance and Television Department of General Electric Supply Co. took **top national honors** in a two-month television sales competition. Joe Effinger of Syracuse, N. Y., national TV sales manager, presented the first-prize plaque to H. C. Davis, Denver district manager, at a dinner in Denver. The Denver district placed first in both its group competition and ranked highest of any district in the nation in attainment of quota on a percentage basis.

House Heating School

An electric house heating school will be held July 10 and 11 at Colorado State University, Fort Collins, Colo. Sponsored by the Colorado Farm Power Council, Colorado State University agricultural engineering department and extension service, the school will cover insulation, electrical heating, equipment selection and installation, heat pumps and how to sell electric heating.

The program has been planned for power suppliers, heating and electrical contractors, architects and others interested in electricity.

Information may be secured from Colorado Farm Power Council, 3020 Pontiac St., Denver 7, Colo., or Colorado State University, Agricultural Engineering Department, Fort Collins, Colo.

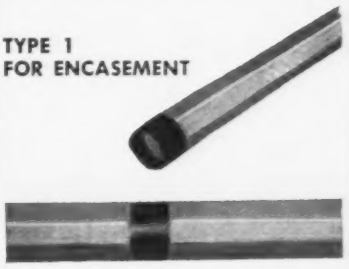
► **Campaigns Pay Off**—It took the biggest ticket drum in San Francisco to hold the record breaking 90,542 entries in the **Northern California Electrical Bureau's** $20,000 prize drawing. More dealers than ever reported follow-up plans and these dealers made sales. NCEB is offering $2,100 in cash prizes for dishwasher sales in a June promotion. Theme is "Don't Be a Dishwasher, Buy One." . . . Final report on **Pacific Power & Light's** dryer campaign showed 4,238 sales during the nine-week drive. This was 107.8% of last year's sales for the same period.

► **World of Wonders** will be the theme of the Sues, Young & Brown spectacular at the Beverly Hilton Hotel on June 22-24. Finding that large-scale wining, dining and entertaining pays off in dealer interest, SY&B this year is spending $32,000 on the party.

New Soapstone OCT-O-DUCT

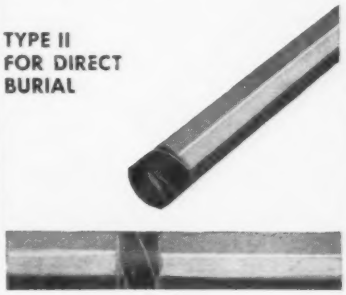
For Both Encased and Direct Burial Installation

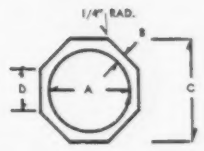
TYPE 1
FOR ENCASEMENT



Now you can lay long-lasting economical Soapstone OCT-O-DUCT faster and easier than ever. No spacers are required. The new spiral-wound, water resistant couplings are ideal for encased installations. The new polyethylene couplings are ideal for direct burial. Write for details of our complete line of duct, and accessories.

TYPE II
FOR DIRECT
BURIAL





OCT-O-DUCT DIMENSIONS (Inches)

A (ID) Duct size	B (Wall)		C (Width)		D (Side)	
	Type I	Type II	Type I	Type II	Type I	Type II
2	.40	.40	2.8	2.8	1.25	1.25
3	.40	.40	3.8	3.8	1.65	1.65
3½	.40	.50	4.3	4.5	1.70	1.75
4	.40	.50	4.8	5.0	2.0	2.1
5	.50	.625	6.0	6.25	2.5	2.55

In addition to above standard OCT-O-DUCT we can manufacture special ducts to order.

SOAPSTONE DUCT COMPANY
3985 Beach St., Oakland 8, Calif.

Distributed in the West by
MAYDWELL & HARTZELL, INC.
San Francisco • Los Angeles • San Diego
Phoenix • Portland • Seattle • Spokane

Superior resistance to shock and fatigue
Forged plates with full radius (corona free) edge
Specify the best—BTC Hi-Line Hardware

THE BREWER-TITCHENER CORPORATION
HI-LINE HARDWARE DIVISION • CORTLAND, N.Y.

Growth

Progressing

Grant County PUD's Priest Rapids Dam on the Columbia River is 45% complete and proceeding ahead of schedule. Present progress indicates some power availability by October 1959.

Wanapum Dam, a companion project of the Grant County PUD, is currently in the design stage. At a recent meeting the elimination of fish ladders at Wanapum Dam was endorsed by the Board of Consultants to the Grant County PUD. Migratory fish will be transported by truck or barge. The PUD, moving rapidly, plans to call for bids for construction in December with completion scheduled for 1964. Initial capability of Wanapum will be 750,000 kw.

► A contract to design, engineer and construct an addition to Colorado Public Service Co.'s recently completed Cameo steam-electric station has been awarded to the Fluor Corp. Ltd. The addition will add 44,000 kw to the station, whose ultimate capability may reach 300,000 kw.

► Lockheed Missiles Division recently announced installation of a $1,500,000 electronic brain at the company's Missile Systems Division, Palo Alto, Calif. The new equipment is an essential duplicate of the Remington Rand scientific computer now in use. Prime function of the new computer will be the solution of space problems.

► Los Angeles economy, as measured in electric power use, is showing greater gains this year than the rest of the country, according to the city's Department of Water & Power. Comparing the first 10 weeks of 1958 with the same period of 1957, production for the U. S. as a whole is up 1%, but the Department of Water & Power electric system shows a gain of 4.14%—or four times the national growth rate.

► Hawaiian Electric Co. will start in June to build its first 138,000-v transmission line, moving up from its present transmission voltage of 44,000. The new line will run from the Waiau power plant on the shores of Pearl Harbor across the Koolau Mountains to serve Honolulu's fast-growing suburbs on the far side of the mountains.

New CROUSE-HINDS EXPLOSION-PROOF MERCURY VAPOR LIGHTING FIXTURES

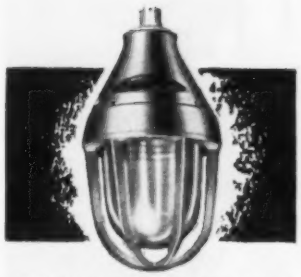
For dependable security at low operating cost in hazardous locations . . .

- *where long burning hours without interruption are involved, month in, month out*
- *where labor cost or trouble of relamping is an important factor*
- *where maximum lighting output calls for maximum economy in power consumption*

The longer life of mercury vapor lamps is well established: 7000 hours, *vs.* 1000 hours for incandescents. Light output is 2.5 times greater; 55 lumens/watt, *vs.* 22 lumens/watt for incandescents.

The new EV's place these economies within easy reach. As with all Crouse-Hinds explosion-proof devices, EV's are heavily constructed to withstand the pressure of internal explosions without rupturing. Gas-tightness is *not* a requirement for their safe performance. Flame-tight joints prevent the escape of flames to flammable atmospheres.

- *For full information, call your Crouse-Hinds distributor, or write for catalog sheet.*



TYPE EVA Explosion-Proof Lighting Fixture

Available with or without guard, or reflector (dome, deep bowl, shallow bowl, angle, or high bay)

250 Watt— National Electrical Code: Class I, Groups C & D

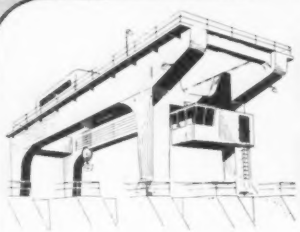
400 Watt— Class I, Group D

CROUSE-HINDS

MAIN OFFICE AND FACTORY: SYRACUSE, NEW YORK
Crouse-Hinds Company of Canada, Ltd., Toronto, Ont.

• CONDULET® ELECTRICAL EQUIPMENT (Explosion-Proof and Conventional) • FLOODLIGHTING
• TRAFFIC CONTROL SYSTEMS • AIRPORT LIGHTING and WEATHER MEASURING EQUIPMENT

These products are sold exclusively through electrical distributors. For application engineering help, contact one of the following offices: Baton Rouge Birmingham Boston Buffalo Chicago Cincinnati Cleveland Corpus Christi Dallas Denver Detroit Houston Indianapolis Kansas City Los Angeles Milwaukee New Orleans New York Omaha Philadelphia Pittsburgh Portland, Ore. Salt Lake City St. Louis St. Paul San Francisco Seattle Tulsa Washington **Resident Representatives:** Albany Atlanta Baltimore Charlotte Chattanooga Jacksonville Reading, Pa. Richmond, Va. Shreveport



GANTRY FRAMES

FOR HYDRO DEVELOPMENTS

It takes know-how and experience to fabricate gantry frames and other steel components for western hydro developments. For information that will show you we have both, write:

GATE CITY STEEL

Box 1487 Boise, Idaho

Executive Offices: Denver, Colorado

Fabricating Plants: Boise, Idaho and Omaha, Nebraska

SURGICAL LINE CLEARANCE BY DAVEY

Davey is doing line clearing for 12 Public Utilities on the Pacific Coast —most of them served continuously for over 20 years. Davey specialized equipment and efficient methods save money . . . Davey surgical pruning benefits trees—builds goodwill.

DAVEY LINE CLEARING

DIVISION OF

DAVEY TREE SURGERY CO., LTD. OF CALIFORNIA

Russ Bldg., San Francisco, SUtter 1-3377

Story Bldg., Los Angeles, TUcker 1929

► The Wyoming Public Service Commission has authorized the Hot Springs Rural Electrification Assn. to borrow $564,000 in REA funds to finance 60 miles of distribution line and 25 miles of 69-kv transmission line.

► Lipsett Inc. of Sioux Falls, S. D., submitted the apparent low bid of $5,250,000 for erecting steel towers for the Bureau of Reclamation power line from Fort Peck to Bismarck, N. D. Approximately 1,500 towers will be used on the 310-mile route.

► Inland Power & Light Co., Spokane, has been granted a loan of $890,000 from the REA for construction of new lines and substation facilities, mostly in Spokane County.

► B. C. Electric Co. recently awarded contracts totaling $6,000,000 for construction and installation of twin penstocks at the company's giant Bridge River project. The penstocks, each 4,900 ft long and 9 ft in diameter, will require 250 railway cars for transit to the site.

► B. C. Electric Co. recently awarded a $10,000,000 contract to Combustion Engineering Super-Heating Ltd. for construction and installation of four steam boilers at its new Ioco thermal generating plant. A second contract for $3,200,000 was awarded to John Laing & Son Ltd. for construction of the power house.

► Peter Kiewit Sons received a $4,900,000 contract for construction of facilities for a packaged atomic reactor heat and power plant at Fort Greeley, Alaska. When completed in 1960, the plant will produce 42,000,000 Btu an hour in steam for heating, and 1,700 kw of electricity.

► Pacific Power & Light Co. has accepted Pole Line Construction Co.'s $148,000 bid to build 31 miles of 115-kv line from Glenrock to Casper, Wyo.

► Water is backing up from one of the privately built dams in the controversial Hells Canyon stretch of the Snake River. Huge concrete bulkhead gates were dropped in place on May 9 at Brownlee Dam of the Idaho Power Co. The reservoir of 1,500,000 acre-ft of water should be filled and power production started this summer. The 395-ft-high dam is second highest rock-fill dam in the world, falling just one foot short of a rock-fill structure in Japan.

Manufacturers—Distributors

► Everett T. Vonier Inc. of Denver has been named Rocky Mountain distributor for American Metal Moulding Co., Irvington, N. J., manufacturer of cables and conduit.

► To take care of expanded operations in the Rocky Mountain area, Landes, Zachary & Peterson Co. will move into a new building at 601 S. Jason St. in Denver about Sept. 1. The firm recently added an instrumentation department under the direction of Gus Veneklausen and added several new instrument lines for distribution in its five-state territory.

► Daystrom Pacific has appointed E. V. Roberts and Associates to handle its potentiometer line in southern California and Arizona, according to Jack H. Zillman, director of sales and engineering.

► Leonard Hobbs, president of Smoot-Holman, reports that Clay Barton, who has been representing the company in north Texas, will take over the Oregon and southern Washington territory. His headquarters will be in Portland.

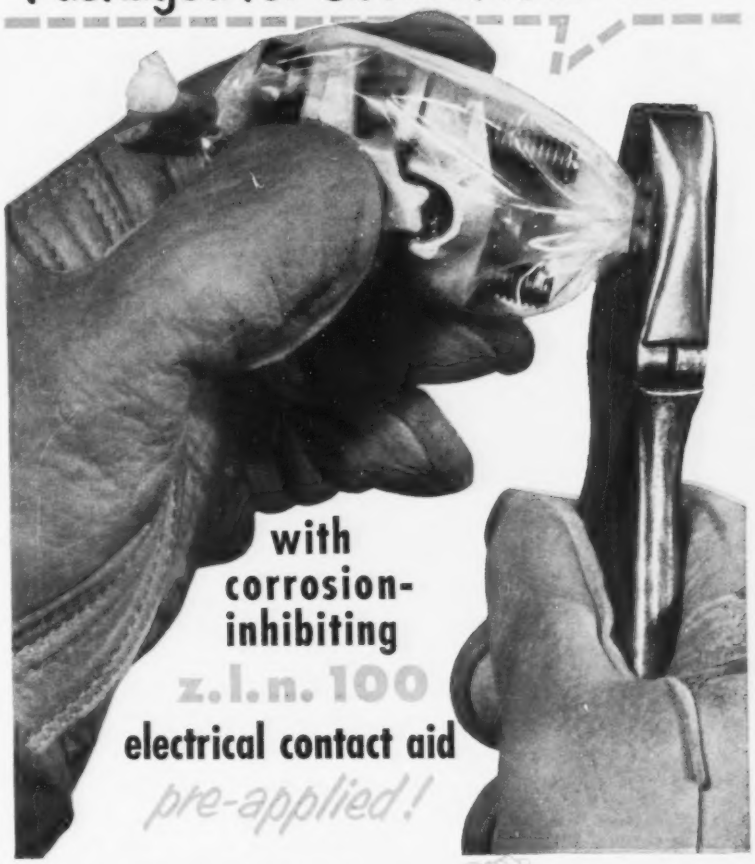
► Hoffman Electronics has appointed Fowler Distributing Co. of Portland to handle its TV receivers, radios and hi fi instruments. Fowler will have the Oregon and southern Washington territory formerly covered by Hoffman Sales of Portland, which is being discontinued.

► Rutkin Electrical Sales Co. has moved to new quarters at 740 Kohler Ave. in Los Angeles. According to Theodore R. Glick, general manager, the new location has about three times the floor space of the old headquarters. The firm plans to store conduit in lifts of about 2,500 lb as they are received from the factory.

► Royal Electric Mfg. Co. is demonstrating additions to its line in a 25,000-mile tour. New aluminum power connectors and welding fittings and the type RVL group operated switch will be carried in the Volkswagen display.

► Spang-Chalfant Division of the National Supply Co. is now represented in Colorado by Arthur E. Bacon Jr., formerly with National Electric Products Corp.

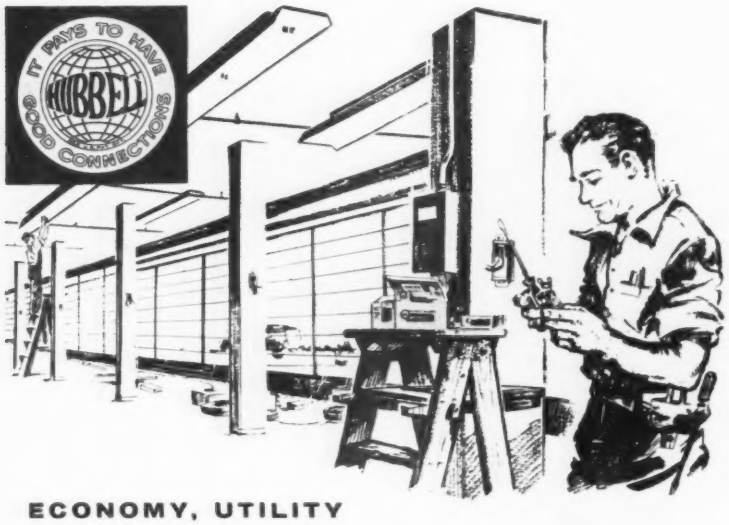
Packaged for Circuit Protection!



All Chance Uniclamps -Parallel Groove Clamps -U-Bolt Connectors -and Hot Tap Clamps are now available in individual plastic packages with z.l.n. 100 pre-applied! Clamp stays clean . . . sealing tape reminds lineman to wire-brush and apply z.l.n. 100 to the conductor too!

A-B-CHANCE COMPANY

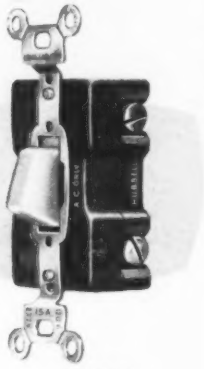
GENERAL OFFICES: CENTRALIA, MISSOURI
(A•B•CHANCE CO. of Canada, Ltd., Toronto) CC58-9



ECONOMY, UTILITY AND CONVENIENCE

NOW,—and for the life of the building!

presSwitch



CAT. NO. **1251-I**
15 amps., 120-277 volts
Single pole A.C. "PRESSWITCH" with thru-connection

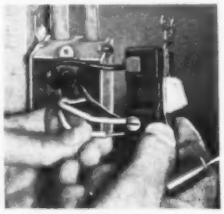
It's time for the switches... and "Presswitch" is your choice for smooth, dependable fluorescent lighting control. From the installation word "go", throughout the life of the building, "Presswitch" is "***quality you can put your finger on***".

"Presswitch" saves installation time, labor and materials. A thru-connection eliminates the usual ground wire splice and the time-consuming cost of taping the splice or inserting a wire nut. Wires normally spliced are securely joined by inserting them under a screw terminal designed for the purpose. (See photo at right.)

Once installed, "Presswitch" looks as smooth as it acts. It's "on" or "off" with the slightest press of the finger or touch of the elbow, providing greater operating convenience wherever it is installed.

Ask for "Presswitch" in single pole, double pole, three-way and four-way, with ivorine or brown nylon button. It operates in any position, fits standard boxes, utilizes standard wall plates.

For Complete Information, Write



SAFE, SECURE
THRU-CONNECTION
SPEEDS AND SIMPLIFIES WIRING, SAVES MATERIALS

HARVEY HUBBELL, INC.

HIGHEST QUALITY
WIRING DEVICES • MACHINE SCREWS

Dept. R-1 BRIDGEPORT 2, CONNECTICUT

WIRING DEVICE OFFICE AND WAREHOUSE LOCATIONS

Bridgeport 2, Connecticut
State and Bostwick Streets

Chicago 7, Illinois
37 South Sangamon Street

Los Angeles 12, California
103 North Santa Fe Avenue

San Francisco, California
1675 Hudson Avenue

IN CANADA:
Scarborough, Ontario
1160 Birchmount Road

► New facilities for Allen I. Williams Co. at Denver include an instrument display room. The firm moved to its new location, 2261-63 S. Albion St., on June 1. At the same time the firm added the counting, timing and frequency control instruments of the Berkeley Division of Beckman Instruments Inc. of California. Herb Woodard, manager for the Williams firm, said additional personnel will be employed to handle the instrument lines.

► Prescolite Mfg. Corp. of Berkeley, Calif., has a new representative at Denver, Al Thompson. Thompson, a Denver native, who worked four years at the Berkeley plant, will handle Colorado, Wyoming, and western Nebraska. He began this assignment by driving one of Prescolite's new Volkswagen display buses throughout Colorado. After the Colorado tour, the bus was taken on tours of other Western states.

► Peterson & Co., Denver, has added the products of Lotran Inc., Baton Rouge, La. The company manufactures radio signaling devices that detect electric outages in distribution and transmission systems.

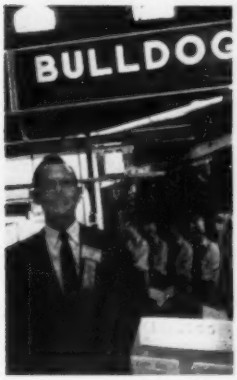
► **T. F. Carter** has been appointed works manager of the West Coast manufacturing plant of Preformed Line Products Co. at Palo Alto, Calif. He succeeds the late **J. W. Ramey.** Carter is a native of Minnesota, and a 1942 graduate of Williams College. He resides in Menlo Park.

Carter

► **Charles S. Allen Jr.** will head up the new electric utility sales division of Hill Transformer Co., Inc., San Carlos, Calif. The appointment follows recent expansion of manufacturing facilities.

► **Alexander N. Shealy** has been appointed head of the electrical engineering branch of Kaiser Aluminum & Chemical's department of metallurgical research at Spokane. He succeeds **Dr. Eugene W. Greenfield.**

► **Ted A. Bender** is now branch office manager for Century Electric in Seattle. He is an application engineer, and a graduate of the University of Washington.



Among exhibitors at Denver Show were these manufacturers' representatives (left to right): James Wall, sales manager, Young Electric, for BullDog; Al Thompson, Prescolite; Arthur E. Bacon Jr. for Spang-Chalfant Division. N E C A members assisted

A First At Denver

The first Denver exhibit designed specifically for the electrical and electronic industries was held in the City Auditorium exhibit hall on April 16-17. More than 70 exhibitors took part.

Sponsored by the Rocky Mountain Electrical Manufacturers Representatives Club Inc. of Denver, the show was open from 10 a.m. to 6 p.m. on April 16 and from noon until 10 p.m. on the 17th.

Featured were displays of large electrical apparatus, switchgear, instruments for electrical controls, lighting systems for industrial and home use, safety devices, signaling equipment, motor controls and motors, power apparatus and primary utility equipment.

Kaub Tilley

Active in staging Denver's first annual Electrical Exhibit were George Kaub, secretary, and Terry Tilley, president of the Rocky Mountain Electrical Manufacturers Representatives Club Inc., sponsor of the show

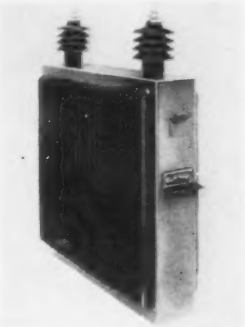
Application engineering section in S&C Electric Co.'s new Western Sales division headquarters in the Millsdale industrial district, Burlingame, Calif. R. S. O'Neill, application engineer for fuses and interrupters, is in the foreground

A MAJOR ACHIEVEMENT IN POWER FACTOR CORRECTION

The New

C-D 100 KVAR CAPACITOR

Cornell-Dubilier announces the first individual capacitor unit rated to deliver a full 100 KVAR. It is available in standard voltage ratings of 4800, 6640, 7200, and 7960 Volts.



Get acquainted with the Power Factor Capacitors that give you better than 99.6% trouble free service.

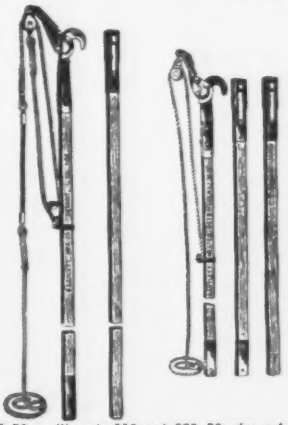
For further information contact

GEO. E. HONN CO.
420 Market St. San Francisco
SUtter 1-7352

TWO GREAT EMERGENCY TOOLS

BARTLETT

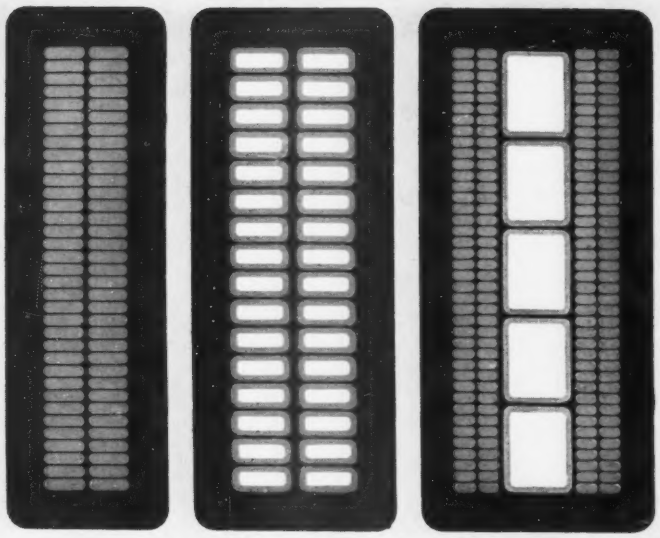
No. 1-BC Wire Cutter
No. 1-WJ Jointed Tree Trimmer



No. 1-BC readily cuts 110 and 220 RC wire and can be used safely for cutting hot 4800 volt primary and service wire when hanging near ground. Has 12" Bakelite insulator. Two 6 ft. pole sections make operation from ground easy.
No. 1-WJ Tree Trimmer will sever 1¼" branches. Pulley action gives added cutting power. Pole in 4' sections for ease of transportation in small car. No 1-W[illegible] with long poles.

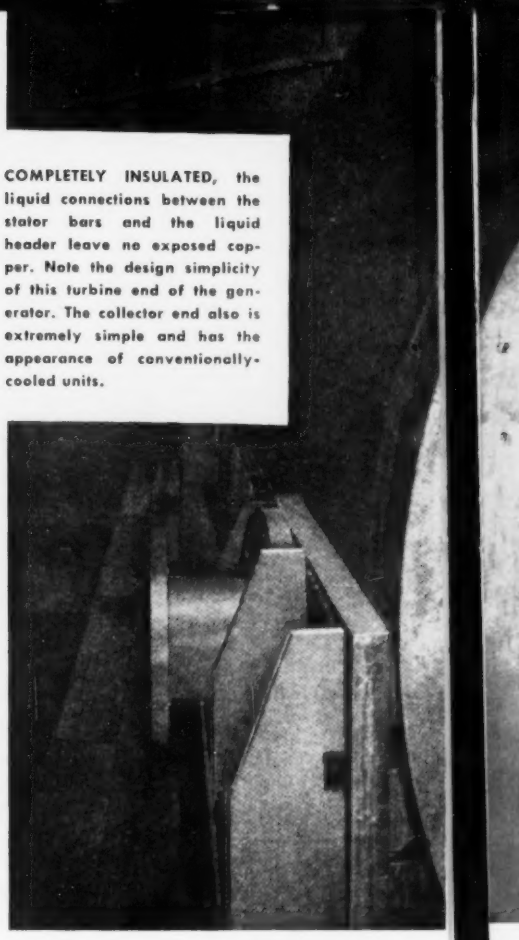
Write for Catalog No. 38 showing complete line of trimming tools.

BARTLETT MFG. CO.
3053 E. Grand Blvd. Detroit 2, Mich



CONVENTIONAL LIQUID-COOLED GAS-COOLED

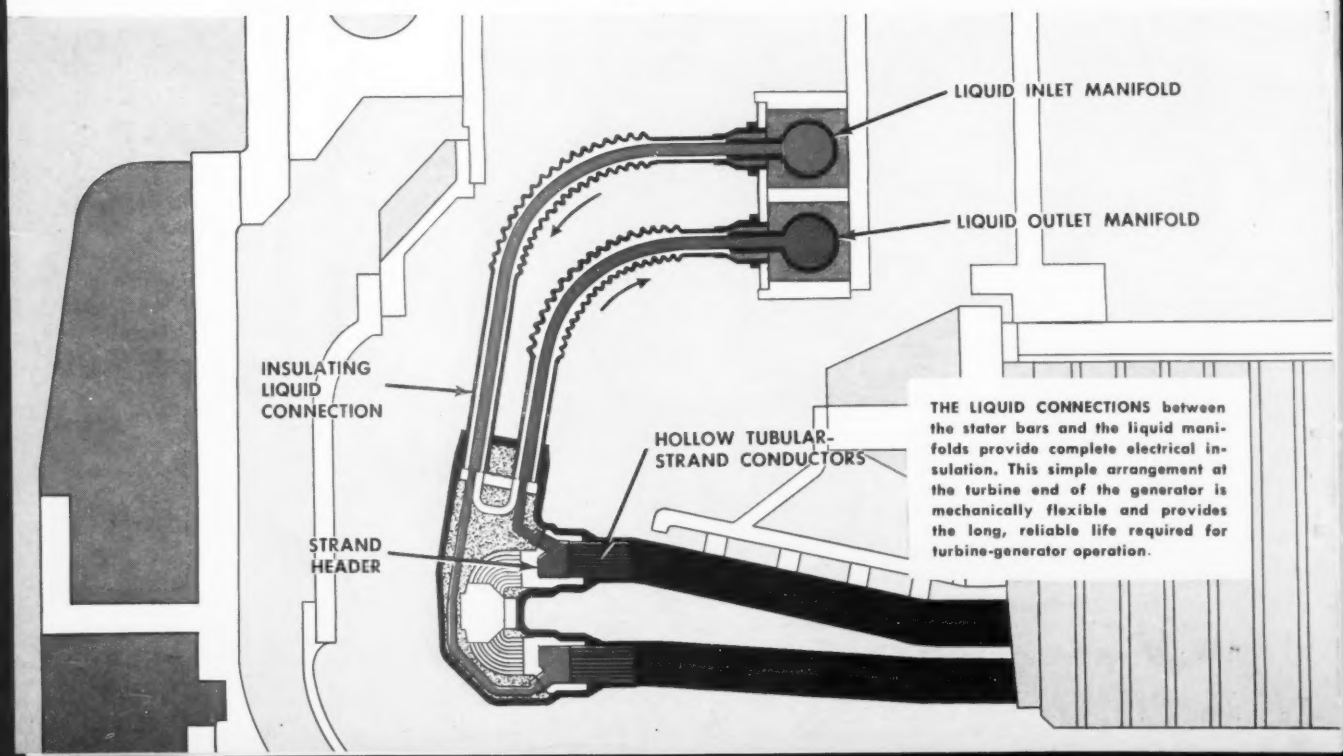
COMPARISONS of three types of stator bars built by General Electric show that dielectric construction of the liquid-cooled bar is as simple as for the conventional bar. Since liquid flows directly through the hollow conductors, no duct insulation is required as in the gas-cooled bar, and heat transfer is considerably improved.



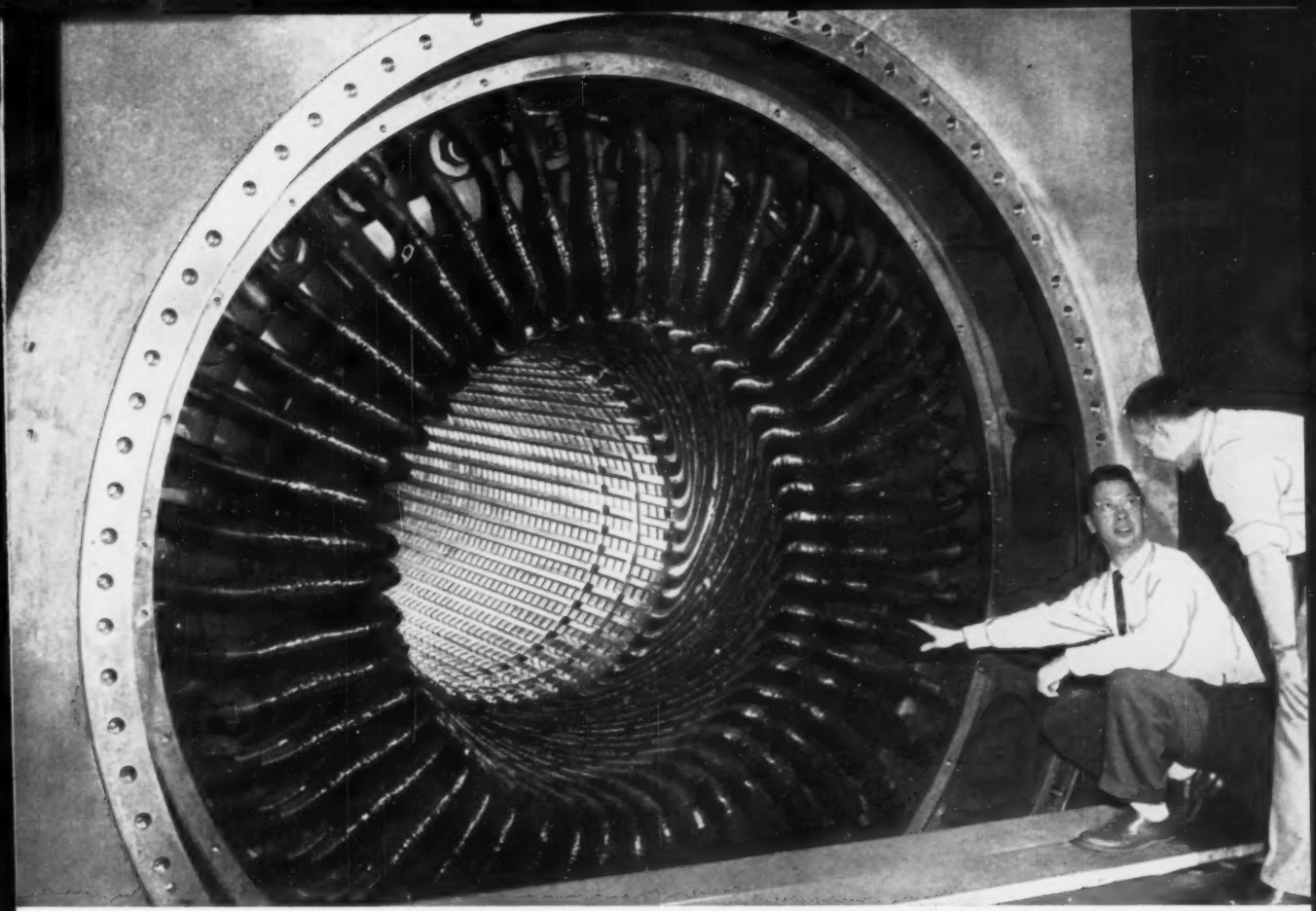
COMPLETELY INSULATED, the liquid connections between the stator bars and the liquid header leave no exposed copper. Note the design simplicity of this turbine end of the generator. The collector end also is extremely simple and has the appearance of conventionally-cooled units.

WITH HIGHER RATINGS NOW POSSIBLE FOR GENERAL ELECTRIC GENERATORS...

Liquid cooling system maintains



THE LIQUID CONNECTIONS between the stator bars and the liquid manifolds provide complete electrical insulation. This simple arrangement at the turbine end of the generator is mechanically flexible and provides the long, reliable life required for turbine-generator operation.



dielectric simplicity and reliability

COMPLETE LINE-TO-NEUTRAL INSULATION ELIMINATES EXPOSED COPPER SURFACES

Despite the tremendous increase in unit output now available with direct liquid cooling of generator stators, the dielectric system remains basically as simple as for conventionally-cooled machines.

Complete insulation of the winding is provided, as in conventional cooling arrangements. Thus, with no exposed copper surfaces, possibility of electrical creepage flashover to ground is practically eliminated.

Within the stator bar, only insulation between strands is required since there are no central cooling ducts to insulate. Not only does this provide more effective utilization of stator slot space and better heat transfer, but it makes possible the simplest dielectric construction of the stator bar.

Dielectric simplicity is just one of the many important features of General Electric liquid-conductor-cooled generators. Other outstanding advantages are:

Increased Generator Output—*Hollow strand stator bar construction can remove up to 16 times more heat than conventional cooling arrangements, permitting higher generator ratings.*

Improved Performance—*Liquid cooling permits automatic regulation of stator winding temperature independent of load.*

Dependable Operation—*Many unique features are incorporated into the design of the closed coolant system to provide a permanently tight liquid circuit.*

Shorter Maintenance Inspections—*Simple, single-stage, low-pressure hydrogen circulating fans facilitate disassembly and inspection.*

For more information on liquid cooling, contact your nearest Apparatus Sales Office or write to Section 254-75 for bulletin GER-1231, Large Steam Turbine-Generator Department, General Electric Company, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL ELECTRIC

GOOD NEWS for

Western Wire and Cable Users

We have just purchased in one lot 340,000 lbs. of top quality cable, the entire warehouse inventory of a large eastern mill discontinuing their West Coast cable operations (name on request).

Here Are Real Cable Bargains

for utilities, contractors, wholesalers, industrials

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Koch

► **M. M. Koch** and **R. T. Person** have been elected executive vice-presidents of Public Service Co. of Colorado. Both have been vice-presidents and have long service with the company. Koch is executive vice-president, electric operations; and Person is executive vice-president, advertising and publicity.

► **J. Dean Worthington** has been appointed chief civil engineer of Pacific Gas and Electric Co. to succeed **Carl W. Appleford,** who retired after 38 years of service with the company. Both men are graduates of the University of California. Worthington joined the company in 1940. As head of the company's civil engineering department, Worthington will have responsibility for the structural and hydraulic design of hydroelectric, steam-electric, and other large construction projects. Appleford, during his 38 years with the company, has been responsible for the structural and hydraulic design of all the company's large steam-electric power plants. He also has directed the structural design for high-voltage substations and transmission lines, and has participated in the design of large hydroelectric developments.

Worthington

Appleford

► **Robert E. Crangle,** manager of the tax and insurance department of Montana Power Co., is retiring because of ill health. He will be succeeded by **Emmett F. Buckley.** Crangle will serve the company as a consultant.

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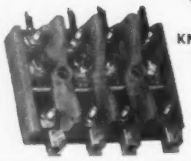

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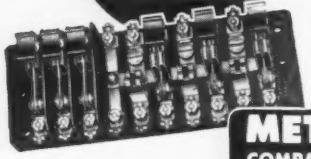

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► **Lou McGuire,** former district manager in the Pacific Northwest, at Seattle, for Copperweld Steel Co., has been named eastern sales manager with headquarters in New York City. Replacing him as Pacific Northwest district manager is **Ralph Craig,** who moves from Glassport, Pa. Craig has been with the company 20 years, and is leaving a position as manager of special products.

Craig

► **M. Randall Marston Jr.** has been named manager, user industries sales department, for the San Diego territory of the Apparatus Sales Division of General Electric Co. He succeeds **Herbert A. Cordes,** who has been manager since 1940 and who continues in the employ of the company as consultant. He has been in San Diego since 1951. Cordes is a native of San Francisco, and a graduate of the University of Southern California. He joined G-E in 1919, and has spent his working career in Los Angeles and San Diego. He is a past president of the San Diego Electric Club, a member of the San Diego Engineer's Club and Joint Engineering Council, past chairman of the San Diego Section of AIEE, and a member of the PCEA.

► **Matt Cabot** now represents Edwards Co. Inc. in the Hawaiian Islands. Cabot was most recently Western sales manager for Day-Brite Co. in Santa Clara.

► **Col. Jackson Graham,** Portland District Engineer, Corps of Engineers, has been selected to attend the 1958-59 course of the National War College in Washington, D. C., and will leave Portland late this summer. He has been Portland District Engineer since September 1955, when he returned from duty in Korea.

► **Col. Walter L. Winegar** will succeed Col. Jackson Graham as Portland District Engineer, Corps of Engineers. Colonel Winegar is a native of Salt Lake City, and was commissioned in the Corps of Engineers in 1939.

► **Clyde Dodd** has been appointed to the staff of Donald S. Gleason & Associates, representative for Prescolite Mfg. Co. in Washington and Oregon.

Cannon

Gamble

► **C. E. "Joe" Cannon,** a member of Washington Water Power's engineering staff since 1929, has been appointed chief engineer for the utility. He succeeds **Lester R. Gamble,** who joined WWP in 1923, and who retired from active service in mid-April. In recent years, Cannon has administered WWP's atomic study program, and has become a popular speaker on the subject in the company's service area. Gamble joined WWP after previous service with Utah Power & Light Co. and the U. S. Army Engineers. He has been chief engineer since 1952, and is a fellow in the AIEE.

► **O. J. "Barb" Barber** is the new Wyoming-Colorado-New Mexico representative for Bryant Electric Co., with headquarters in Denver. It is a new territory for the company, but not for Barber, who has worked out of Denver for Mountain States Telephone Co., Westinghouse Lamp Division, and E & M Equipment Co.

Barber

► **Frank X. Blackwell** has been appointed vice-president of Supreme Lighting Co., Los Angeles. He will continue to function as sales manager. **E. William Ross** is named assistant sales manager and **Sy Hughes** is in charge of architectural and engineering contacts. Hughes will also supervise the company's new products research.

► **J. E. Bolton** has been named Salt Lake house sales manager for General Electric Supply Co.

► **Arthur B. Kenny** was elected business manager for Local No. 77, IBEW, Seattle, Wash., effective Jan. 1. He was formerly business representative for coast construction with this local and has also held a similar post in Spokane. He succeeds Henry M. Conover, who has taken a new position as director of utilities.

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Engel

Steele

► **Richard L. Engel** has been appointed manager of Allis-Chalmers Industries Group Pacific region. He will be succeeded as Los Angeles district manager by **Donald E. Steele.** Engel has been with Allis-Chalmers since 1939, and is a member of PCEA and the Los Angeles Electric Club. Steele is a mechanical engineering graduate of the University of Washington, and has been with the company since 1947.

► **Horace L. Ouzts** has been named district manager at Thermopolis, Wyo., for Pacific Power & Light Co. He moves to the new position from an electrical engineering assignment in Casper.

► **J. H. Clawson,** treasurer of Puget Sound Power & Light Co., has been elected a vice-president by the board of directors. He will continue to serve as treasurer. Clawson joined the company in 1933, and became treasurer in 1947. He is a national director of the Controllers Institute of America.

Clawson

► **Joseph M. Pettit,** professor of electrical engineering, will become dean of the Stanford University School of Engineering, Sept. 1, to succeed **Frederick E. Terman,** who is university provost.

► **Joseph Pirtz** Jr., a 21-year veteran of Pacific Gas and Electric Co. service, has been appointed manager of hydro-electric construction for the company. He succeeds H. W. Haberkorn, who was promoted to vice-president in charge of general construction. He is in charge of the Kings River project for PG and E.

Pirtz

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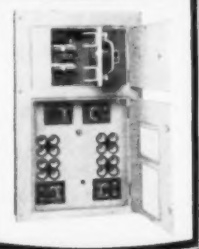

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Karl L. Bachman, services and publications assistant at Washington Water Power Co., recently received his second award from Freedoms Foundation for a public address entitled, "The American Concept." He won a similar award from Freedoms Foundation in 1952. Bachman (left) receives the medal and a check for $100 from Matthew W. Hill, chief justice of the Washington State Supreme Court. Bachman is from Germany

---

► **William C. Mearns** has been named vice-president in charge of Vancouver Island operations of British Columbia Electric Co. He succeeds **Ernest W. Arnott,** who is retiring after 48 years of service. Mearns has been with the company 25 years.

► **C. M. Newbill** has been appointed district sales manager at San Francisco for Graybar Electric Co. Inc. He has been with the company since 1924, serving most of his time in Texas and St. Louis. He leaves the position of district sales manager in Dallas to take the San Francisco appointment.

Newbill

► **Herald Gwilym** has been promoted to supervising senior engineer in charge of the underground engineering section, inside construction division, of Seattle City Light. Gwilym is an electrical engineering graduate of the University of Washington, and has been with Seattle City Light 35 years.

► **John Evans, Walter Coffman** and **Gene Dorman** have joined the sales force of Leadlight Fixture Co. Evans will be in San Francisco, Coffman in San Diego and Dorman in Seattle.

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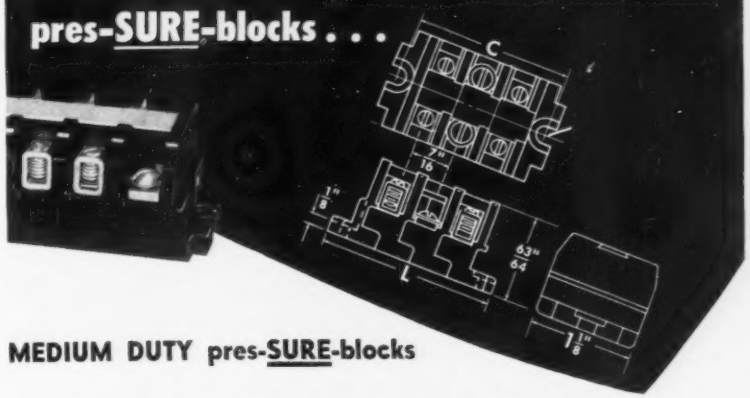

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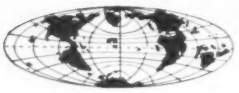

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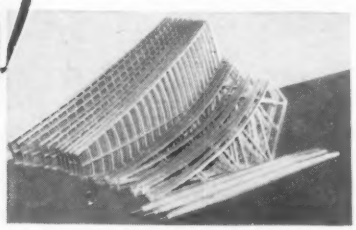

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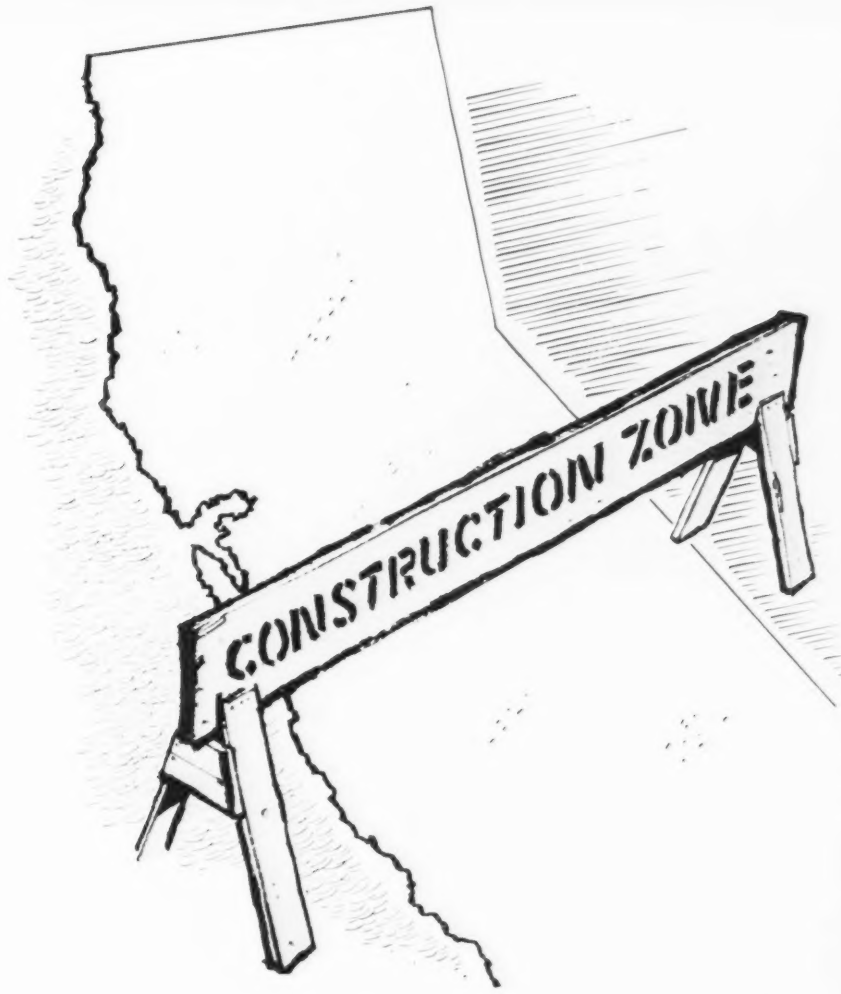

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